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ABSTRACT

This report covers the University of Akron's impact on the income, employment, credit availability, governments, and individuals within the community in which the school is located--Summit County, Ohio. Presented is evidence of the impact, as measured by the American Council on Education economic impact model, of the university on its service area. Results of the study show a reasonable and definable impact of the university as an economic entity. Following chapters on research methodology, purpose, and a description of the geographic area involved, the report examines the school's: (1) economic impact on Summit County business, i.e., business volume, property, credit base expansion, and unrealized business volume; (2) the economic impact on governments in terms of revenue generation, municipal and public school expenses, governmental property, foregone property taxes, and university municipal services; and (3) the economic impact on individuals involving employment, personal income, and durable goods. Also examined is the contribution in terms of productivity of university graduates and the earnings potential which occurs as a consequence of their advanced levels of formal education. The appendix provides a comparison of the University of Akron studies, a history of the University of Akron, a list of data sources, and a summary of higher education economic impact studies. Contains approximately 250 bibliographic references. (GLR)

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AND ITS ECONOMIC IMPACT
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THE UNIVERSITY OF AKRON AND ITS ECONOMIC IMPACT ON ITS COMMUNITY

A research report

for

Office of the Senior Vice President and Provost
College of Business Administration Center for Taxation Studies
Office of Vice President for Institutional Advancement

F. Bruce Simmons III

September, 1992

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The author was commissioned to conduct this study by the Office of the Senior Vice President and Provost, the Dean's Office of the College of Business Administration and its Center for Taxation Studies, and the Office of Vice President for Institutional Advancement.

THE UNIVERSITY OF AKRON
AND ITS ECONOMIC IMPACT
ON ITS COMMUNITY

EXECUTIVE SUMMARY:

Higher education serves to create knowledge and to stimulate learning, to ensure an educated citizenry, and to achieve specific social goals, such as, supplying trained women and men, economic growth and productivity, and equality of opportunity. The degree to which contemporary social investment in higher education serves the emergent social goals of promoting social equity and opportunity is a matter of community debate. Generally, higher education in the U. S. acts to redistribute wealth from the richer to poorer segments of our society. University education does pay off, in most cases, for the person who invests in higher education. It also pays off for its community.

Citizens of the U.S. have an admiration for education. The assumption that prosperity and education are strongly correlative remains an article of faith. Commitment to higher education remains one of our nation's highest priorities. However, in Ohio, higher education remains under funded in comparison to other states. We are ranked 39th nationally in support, and ranked lowest of the 13 Midwestern states at $4,203 per year per full time student. In Ohio, more than 19 high school students dropped out of school for every 100 who graduated during 1989-1990 school year. The drop out rate dramatically increases in urban areas.

This report covers The University of Akron's impact on area income, employment, credit availability, governments, and individuals. Applying techniques, developed in similar educational institution studies, this

report presents evidence of the impact that The University of Akron has on its service area. Since every dollar initially spent in Summit County turnsover several more times, the total economic importance of The University of Akron is a multiple of its direct dollar expenditures. Using the American Council on Education economic impact model that does not require the extensive volumes of data needed to create a regional input-output model, our study's findings include the following.

The University of Akron contributes:

$241,115,895 net positive impact on Summit County businesses;

$28,629,079 expansion of local banks' credit base resulting from university related deposits;

$152,834,935 of local business property committed to university-related business;

15,178 jobs generated by university operation;

$149,541,761 personal income generated by university operations;

$23,702,369 in consumer durable goods purchased via incomes from university operations;

$17,039,501 in Summit County government revenues generated by university presence (including tax revenues and state aid);

$51,448,456 in State of Ohio revenues generated by university presence (including tax revenues and state aid);

$35,509,249 in local government operating costs attributable to the university's presence with $41,282,957 of local government properties devoted to these services;

$4,171,149 in property taxes foregone to local governments; and

$1,602,315 in services provided by the university to Summit County governments.

The primary function of The University of Akron is to meet the educational needs of its urban community. The University of Akron is recognized in its community as an educational and cultural asset. This study documents another dimension. The existence of The University of Akron adds considerable wealth and employment to Summit County, Ohio. The purpose of this study is to assess the economic benefit created by the University of Akron on its surrounding community. We do so by calculating the economic impact of the university on its home county. The results of this study show a reasonable and definable impact of The University of Akron as an economic entity.

Economic impact studies vary greatly in the methodological approaches utilized as well as in the level of information yielded. The author makes no claims to theoretical purity or completeness in the methods used. The methods are intended only to provide explicit, reasoned, straight forward procedures for estimating the more direct economic impact of The University of Akron on its neighboring community. If anything, these procedures tend to understate the positive effects.

In order to avoid overstating the economic impact, this study used conservative analytical methods. The reader must realize that these results are short-term quantitative measures. Please be aware that the computation requirements of the ACE models were met by obtaining data from university records, federal population census and commerce surveys; state commerce, educational and taxation reports; county records and reports; and estimated data from the better sources available. As a consequence, the author is confident that for each variable of measure, the results given about the impact of The University of Akron on Summit County have been understated.

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THE UNIVERSITY OF AKRON AND ITS ECONOMIC IMPACT ON ITS COMMUNITY

INTRODUCTION

The citizens of the State of Ohio have supported their institutions of higher education through generous personal gifts and public tax support and through the enrollment of their children. These institutions of higher education serve to create knowledge and to stimulate learning, to ensure an educated citizenry, and to achieve specific social goals, such as, supplying trained women and men, supporting economic growth and productivity, and fostering equality of opportunity. The degree to which contemporary social investment in higher education assists the emergent social goals of promoting equity and opportunity is a matter of community discussion. The presumption that .

Citizens of the U. S. have an admiration for education. Generally, in the U. S., higher education acts to redistribute wealth from the richer to poorer segments of our society. University education does pay off, in most cases, for the person who invests in higher education. It also pays off for its community.

As indicated in Table One, the primary function of The University of Akron is to meet the educational needs of its urban community. The University of Akron is recognized in its community as an educational and cultural asset. This study documents another dimension. It covers The University of Akron's impact on area income, employment, credit

TABLE ONE

MISSION AND GOALS OF THE UNIVERSITY OF AKRON

The University of Akron's mission is influenced by its location, its heritage, its teaching and research objectives, and its responsibility to serve the local, national, and international communities.

These influences, combined with the University's commitment to provide the highest quality educational opportunity possible to each person regardless of race, creed, color, sex, age, national origin, or handicapping condition, shape this institution's distinctive character.

The foremost goals of The University of Akron are to create and maintain the highest standards of excellence in its curriculum, its teaching/learning process, its development of students, its research, and its service to the public. Existing and proposed programs alike are evaluated in terms of their contributions to these goals.

The historically strong interrelationship between The University of Akron and surrounding community confirms The University of Akron's responsibility to serve the community in ways that will reflect the needs of both the institution and the region of which it is a part. The University will continue to serve those pursuing a traditional educational program as well as those seeking a non-traditional program for a career change, for professional development, or for self-enrichment.

Source: University of Akron, General Bulletin. 1991. p.4.

availability, governments, and individuals. Applying a quantitative models technique, developed in similar educational institution studies, this report presents evidence about the economic impact that The University of Akron has on its service area. Since every dollar initially spent in Summit County turnsover several more times, the total economic importance of The University of Akron is a multiple of its direct dollar expenditures. Since the American Council on Education's (Caffrey and Isaacs 1971) economic impact model does not require the extensive volumes of data that are needed to create a regional input-output model, this report's findings document that the existence of The University of Akron adds considerable wealth and employment to Summit County, Ohio. The results of this study indicate the reasonable and definable impact of The University of Akron as an economic entity. However, this study did not arrive at any estimate of the university's optimum economic value.

NEED FOR STUDY

Over the past quarter century, several trends have cumulatively placed strong demands on higher education's access to resources. The general tendency for all prices that are charged for goods and services to increase is reflected in the expenditure required to obtain a university education. Although the post World War II "baby boom" generation required an increase in the physical facilities and employees, it has largely passed through the higher education system. However, in its path the number of high school graduates continues to steadily head downward. The trend toward earlier retirements from the work force and for a lengthier life span, when coupled with the growth in the number of programs available for senior citizens, has placed an accelerated need for the funding of these services. Changes in rates of immigration and the labor force participation rates of females have also impacted our society. In 1950, international trade accounted for approximately nine percent of annual U. S. goods and services. It now accounts for about twenty five percent. Since 1973, the decline in the real, inflation adjusted, output per unit of labor productivity also has reduced the ability of society to respond to educational needs. The combined effect of these inflationary, demographic and trading forces contributes to the erosion in the strength of higher education's claim for private and public support. As a consequence, higher education has been pushed down the public agenda and is being severely squeezed in the public budget.

Historically, higher education's relationship with state legislators has been fragile, sporadic and defensive at best. Many legislators know little about the overall economic impact of colleges and universities on their service region because this data was not readily available (Bernstein 1985). This study is intended to increase their awareness of the contribution higher education makes on Summit County.

As indicated in Table Two, based on 1991 enrollment, The University of Akron is the largest institution of higher education in Northern Ohio. Further, during Autumn, 1987, The University of Akron was ranked as the 43rd largest campus in the U. S. In the State of Ohio, only Ohio State University (2nd largest) and the University of Cincinnati (28th largest) had an enrollment greater than our university.

As the competition for scarce governmental resource increases, it will be increasingly important for The University of Akron to exhibit its economic worth to its community. Taxpayers and legislators are demanding that institutions of higher education become more efficient in their employment of resources and become more accountable to the public in how taxpayer funds are being spent.

In the State of Ohio, commitment to higher education must remain one of Ohio's highest priorities. In order to more effectively provide for its citizenry, the State of Ohio must maintain its trust and faith in the development of its people. Prosperity and education are strongly correlative.

TABLE TWO

NORTHERN OHIO COLLEGES AND UNIVERSITIES

(ranked by full-time equivalent enrollment)

Institution	Student	Faculty		Endowment
	FTE*	FT*	PT*	($ millions)*
University of Akron	21,076	904	940	40.6
Kent State University	19,689	811	532	12.8
Cleveland State University	13,219	559	300	4.5
Cuyahoga Community College	12,300	386	750	1.0
Case Western Reserve Univ.	8,557	1,646	81	419.8
Lorain County Community Coll	7,400	104	205	3.2
Lakeland Community College	4,121	95	354	NA
John Carroll University	3,891	204	115	26.0
Baldwin-Wallace College	3,765	148	150	42.0
Oberlin College	2,820	237	28	229.0
Hiram College	1,200	74	54	21.0
Ursuline College	1,194	59	73	4.2
Dyke College	815	24	63	0.4
Notre Dame College of Ohio	656	36	51	4.8
Lake Erie College	549	32	29	4.6
Cleveland Institute of Art	465	72	47	13.4
N.E.O. College of Medicine	406	479	157	0.8
Ohio Coll of Podiatric Med.	322	21	27	2.8
Cleveland Institute of Music	306	38	65	12.2
Capital University	135	4	60	13.0
Cleveland Coll.-Jewish Study	110	3	18	NM

Footnotes: * Enrollment is based on the full-time equivalent (FTE) enrollment, a figure obtained by dividing the total number of credit hours taken by all students by the number of ours required by each institution for a full-time course load. Number of faculty is full-time (FT) and part-time (PT). NM: Not meaningful. NA: Not available.

Source: Crain's Cleveland Business, March 25, 1992.

PURPOSE OF THIS STUDY

A primary objective of this study is to provide and interpret objective and reliable data measuring the annual contributions of The University of Akron. The primary role of economic impact analysis is to measure the additional increase in the county's economic activity attributable to the presence of the university. Other prospective uses of economic impact study results are:

> to inform Summit County citizens and their political leadership about the economic advantages of The University of Akron and its impact on its county in the form of expenditures, payroll, income, jobs and taxes;
>
> to educate legislators, economic development officials, and the general public about educational benefits that are both economic as well as educational;
>
> as policy and planning tools which aid university executives in setting the goals and objectives for their various programs.
>
> to assist executives in measuring the benefits and cost of educational activities.

On July 1, 1967, The University of Akron became a member of the State of Ohio University System. Table Three and Table Four provide an indication about the growth of the university during the past twenty five years. During the first twenty five years as a state university, our student enrollment has increased. Faculty and administrator employment has also risen.

TABLE THREE

UNIVERSITY OF AKRON STUDENT ENROLLMENTS: 1967-1992

Fall Semester	Day	Evening	Total
1967	8,002	5,614	13,616
1972	13,987	5,786	19,773
1977	15,245	7,876	23,121
1982	18,098	8,471	26,569
1987	19,422	7,647	27,069
1992	16,393	11,848	28,241
Change 1967-1992:	8,391	6,234	14,625
Percentage Change 1967-1992:	104.86	110.40	107.41

Source: University of Akron Registrar Records

TABLE FOUR

UNIVERSITY OF AKRON EMPLOYMENT: 1967-1992

Year	Full-time Faculty	Administration	Staff	Graduate Assistants	Total
1967	257	112	NA	NA	369
1972	NA	NA	NA	NA	NA
1977	623	200	745	454	2032
1982	737	232	842	652	2463
1987	810	313	880	877	2880
1992	827	350	1,075	1142	3327
Change 1967-1992:	570	238			
Percentage Change 1967-1992:	221.79	212.50			

NA: data were not available.

Source: University of Akron Personnel Records

GEOGRAPHIC AREA INCLUDED IN THIS STUDY

There exist at least five separate economic mechanisms, or linkages, which transmit the effects of The University of Akron onto its service area. These linkages are:

> The productivity of its graduates and the earnings potential which occurs as a consequence of their advanced levels of formal education;
>
> The attractive amenity effects such as locating one's business in a university community to enjoy access to its libraries, cultural and sporting events, continuing education and seminars, speaker series, and other affective activities;
>
> The region relevant knowledge of using university faculty in public service, business and engineering consulting, and other university outreach activities, such as institutes, industrial parks, and incubators;
>
> The direct expenditures by its faculty, administrators and librarians, staff, and students; and
>
> The indirect economic impact of university related expenditures as measured through the usage of multipliers.

The urban community most impacted by the presence of The University of Akron is defined to be Summit County, Ohio. Summit County is one of the two counties in the Akron Statistical Metropolitan Area. The other county, Portage, contains a major state university and a consortium medical college. Since Portage County has a medical college and state university, it was excluded from any data collection. The Akron Statistical Metropolitan Area is one of the areas that is combined with others into the greater Cleveland Statistical Metropolitan Area. Other contiguous counties include: Stark, Cuyahoga, Wayne, and Medina. Cuyahoga County contains a state university, at least two private universities, and a state junior college. Stark County has a state university branch campus and a private college. Medina County also is served by other institutions of higher education. Since sister institutions in their respective economic impact studies have used these counties, in order to avoid confusion and overlapping with their service areas, only Summit County is used as our defined area.

The University of Akron possesses a branch campus in rural Wayne County. The branch campus total payroll equals $2,540,804. Total investment for land, equipment, and buildings is $22,194,487. From among total university enrollment of 27,278, it appears that 736 students are residents of Wayne County. At least 158 of these students are in graduate programs and attend class on the main campus. Since the American Council on Education (Caffrey and Isaacs 1971) model is difficult to use when service areas of institutions overlap, the contribution of the branch campus is not directly estimated in this study.

In 1990 U. S. population census, Summit County contained 514,990 residents. This represents a decrease from 1980's census of population of 524,472 people. The calendar year 1991 fair market value of Summit County real estate was $20,949,065,296. The dollar sales volume of the 8,759 Summit County businesses which were subject to federal income tax withholding was $13,669,623,000. As indicated in Table Five, The University of Akron is the fourth largest Summit County employer.

TABLE FIVE

LARGEST EMPLOYERS IN SUMMIT COUNTY

(Ranked By Employee Size)

Company Product/Service		Employees
The Goodyear Tire & Rubber Co.	5700	Rubber
Summit County	4900	Government
SUMMA Health System	4418	Medical
University of Akron	3422	Education
Acme-Click (Albrecht Grocery Co.)	3297	Grocery & Discount
Akron Board of Education	3278	Education
Chrysler Twinsburg Stamping Plant	3000	Automotive
Babcock & Wilcox (McDermott Co.)	2800	Nuclear & Fossil
City of Akron	2500	Government
Akron General Medical Center	2434	Medical
Roadway Services, Inc.	2100	Transportation
Children's Hospital Medical Center	1853	Medical
Ohio Edison Co.	1690	Utilities
Bridgestone/Firestone, Inc.	1650	Rubber
Loral Defense Systems	1550	Electronic Systems
Little Tikes, Inc.	1355	Toys
First Bancorporation of Ohio	1273	Banking
Aircraft Braking Systems	1200	Aircraft Brakes
Sterling, Inc.	1180	Jewelry Stores
May Co.	1161	Department Stores
Consolidated Freightways	1040	Trucking
Dairy Mart Midwest Division	967	Dairy
General Tire, Inc.	966	Rubber
ALLTEL Corp.	940	Utilities
The Ohio Bell Telephone Co.	882	Utilities
Revco D. S. Inc.	856	Pharmaceutical
Weaver Industries	850	Packaging
K-Mart Discount Stores	800	Discount Stores
Uniroyal Goodrich Co. (Michelin)	750	Tires
Bank One, Akron	714	Banking
Allstate Insurance Co.	700	Insurance
BFGoodrich Company	670	Chemical & Plastics
GenCorp	623	Aerospace/Polymer
Akron Beacon Journal	615	Newspaper
Cuyahoga Falls Board of Education	612	Education
MACtac/Morgan Adhesives Co.	605	Paper Coatings
Cuyahoga Falls General Hospital	597	Medical
J.C. Penny Co.	566	Department Stores
Fabricenters, Inc.	500	Retail Store

Source: Akron Regional Development Board, Directions, May/June 1992.

METHODOLOGY

A local economy consists of several primary activities that serve the outside world and, therefore, bring in revenues through which the community can obtain goods and services from the outside. The primary activities that bring in outside revenues are farming; manufacturing; mining; wholesale trade; railroads; service businesses; regional headquarters of state and federal governments; and universities (Bowen, 1972). Service businesses cover such activities as research and development, consulting, publishing, tourism, and nonprofit institutions. Non profit institutions include zoological and botanical parks, medical clinics, museums, and historic homes. Summit County contains organizations that span the entire domain of these primary activities. The people in Summit County cannot exist solely by taking in each other's laundry. They must participate in primary economic activities.

The logical interplay between the economic literature about regional growth analysis and about the investing in human capital is the economic impact that educational institutions make to their local communities. While other regional growth models do exist and have been used in some studies, the American Council on Education's (Caffrey and Isaacs 1971) model appears to be better suited for use in analyzing the economic contributions of the urban university.

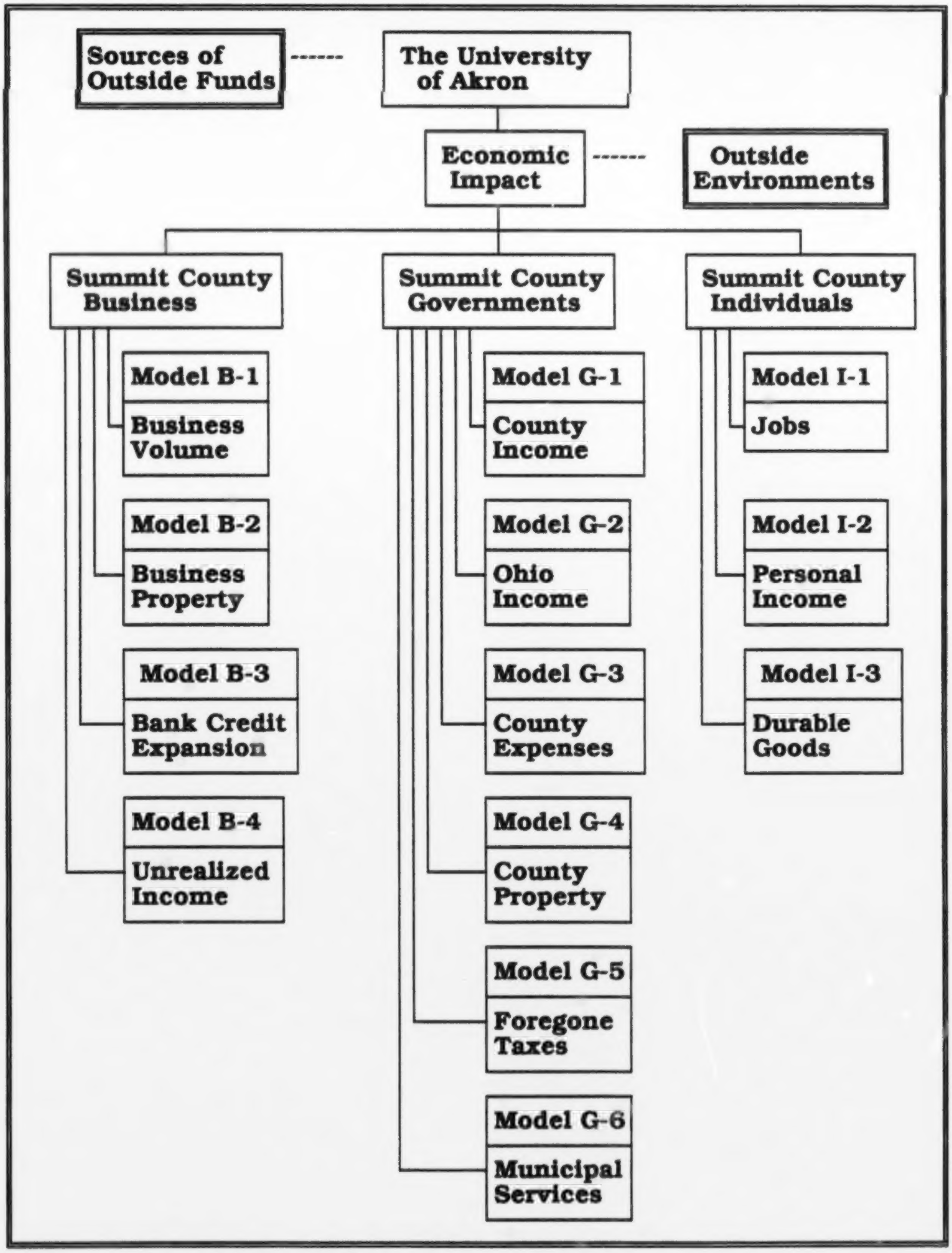
The predominate model used in the determination of the economic impact of a university on its surrounding community was written for the American Council on Education (Caffrey and Isaacs 1971). While many studies do not strictly adhere to all the models and their requirements, nevertheless the Caffrey and Isaacs set of models have remained the standard point of reference in this field. Their set of models relied on the methodology which consisted of a comprehensive set of simultaneous equations. These interrelated equations served as the means by which to assess the direct economic and fiscal impact on local business, governments and individuals that was made by the university. In Figure One, a schematic overview of the component models and their interrelationships is presented. Although a fair amount of statistical data must be collected, for example twenty different measures of impact on the local economy must be collected, this collection of economic models offered quantitative results about the impact of the university's operations on Summit County's economy.

The Caffrey and Isaacs models are constructed to capture the impacts on three sectors of the local economy: business, government, or individual. In their terminology, a model which serves to estimate an impact on the business sector is represented as a B-# model. The four major business groups are numbered as B-1, B-2, B-3 and B-4, respectively. A model which serves to identify an impact on the governmental sector is represented as a G-# model. The six major governmental models are numbered as G-1, G-2, G-3, G-4, G-5 and G-6, respectively. The models which indicate the impact on individuals are represented as I-# model and are numbered as I-1, I-2 and I-3, respectively. Each of the sectors of the local economy are measured and divided into groups and subgroups. Within each sector the various subgroups are merely cumulative. However, each sector model, whether a B-# model, G-# model, or I-# model, expressed a different and non-additive impact. It is a mistake to simply sum across sectors and to make any claim based on such erroneous application of the results of this study.

The notation scheme for each of the models has been adapted from

FIGURE ONE

ECONOMIC IMPACT MODELS


Sources of Outside Funds
The University of Akron
Economic Impact
Outside Environments
Summit County Business
Summit County Governments
Summit County Individuals
Model B-1
Business Volume
Model B-2
Business Property
Model B-3
Bank Credit Expansion
Model B-4
Unrealized Income
Model G-1
County Income
Model G-2
Ohio Income
Model G-3
County Expenses
Model G-4
County Property
Model G-5
Foregone Taxes
Model G-6
Municipal Services
Model I-1
Jobs
Model I-2
Personal Income
Model I-3
Durable Goods

Source: Adapted from Caffrey and Isaacs, p.10.

Caffrey and Isaacs. Total amounts are shown with capital letters (e.g. P = purchases; UR = university related; E = expenditures). Coefficients, or fractional multipliers, are indicated by lower case letters (e.g. f_H = fractional multiplier, or proportion, of faculty and staff who rent housing; e_H = proportion of a tenant's total expenditures likely to be spent for rental housing). Indexes, or simple proportions, are represented by lower case mnemonics (e.g. amv = ratio of assessed to market value of real taxable property; cbv = cash-to-business-volume ratio). Each model and sub-model is shown with a detailed discussion about the methodology, data sources, and computations employed.

The implicit model about the local economy has not been changed during the past thirty years. However, the academic literature contains discussions about the several shortcomings inherent in this model. As a single year model, it does not deal with drift over time in the estimated parameter values (Pleeter 1980). Any model based on a Keynesian consumption function displays weaknesses, such as the estimated economic base multipliers, exhibits a wide variability (Frey 1989). Economic impact models ignore the externalities of the university, such as, noise, congestion, cultural and recreational benefits, its attractiveness to industry and residents, nor does it compare U A's economic impact with other primary activities that form the base of the county's economy. Also, the model assumes that a significant proportion of an institution's enrollment is drawn from outside the local area. In short, student enrollment represents an influx of new money into the local community. While the model is most strained when focusing on a community college or a commuter urban institutions, several modifications in the model have been made in the many studies pertaining to the economic impact about such institutions. This model appends part-time students as visitors because it is assumed that their expenditures would not leave the local economy and therefore they have relatively little impact. Further, the reliance on using surveys of faculty, administrators, full time students, staff and visitors presented several problems. Many studies report survey response rates ranging from 28 to 47 percent of the targeted population. A census with such a low response rate raises concerns about reliability and validity of figures. Surveys present problems about timing and resource availability. It is not totally clear as to which particular type of surveying method yields the better results. Mail surveys are given the slight edge (Elliott, Levin and Meisel 1988).

This study follows those researchers who departed from the Caffrey and Isaacs survey methodology. This study substitutes readily available census, labor and personal income data. Where this data is employed it is noted for the reader in order to enhance credibility of the study, and to minimize the perception that is self-serving and therefore it is not reliable. In measuring the level of economic activity, it is necessary to separate new expenditures and income from those that would have taken place anyway to indicate the net economic impact. Where it possible to do so, the numbers from 1967 would have been subtracted from the 1992 data. The author acknowledges that a substantial portion of the subsequent model discussion is summarized or extracted from the work of Caffrey and Isaacs (1971) and other economic impact study researchers.

Economic impact studies vary greatly in the methodological approaches utilized as well as in the level of information yielded. The author makes no claims to theoretical purity or completeness in the methods used. The methods are intended only to provide explicit, reasoned, straight forward procedures for estimating the more direct economic impact of The University of Akron on its neighboring community. If anything, these procedures tend to understate the positive effects.

This study used conservative analytical methods in order to avoid overstating the economic impact. The reader must realize that these results are short-term quantitative measures of the university's impact. In analyzing this report, please be aware that the computation requirements of the American Council on Education models were met by obtaining data from university records, federal population census and commerce surveys; state commerce, educational and taxation reports; county records and reports; and estimated data from the better sources available. Where arguable judgments were required, this study provides any alternative calculation necessary for comprehending the research. As a consequence, the author is confident that for each variable of measure, the results given about the impact of The University of Akron have been understated.

THE ECONOMIC IMPACT OF THE UNIVERSITY OF AKRON

The existence of The University of Akron adds considerable wealth, credit and employment to Summit County, Ohio. The purpose of this study is to assess the economic benefit created by the University of Akron on its surrounding community. This report does so by calculating the economic impact of the university on its home county. The results of this study show a reasonable and definable impact by The University of Akron as an economic entity. However, this study did not arrive at any estimate of the university's optimum economic value.

The primary function of The University of Akron is to meet the educational needs of its urban community. The University of Akron is recognized in its community as an educational and cultural asset. This study documents another dimension. Applying a technique, developed in similar educational institution studies, this report presents evidence of the economic impact that The University of Akron has on its service area.

Since every dollar initially spent in Summit County turnsover several more times, the total economic importance of The University of Akron is a multiple of its direct dollar expenditures. Using the American Council on Education economic impact model, this study's results indicate that the direct and indirect economic impacts of the expenditures made by The University of Akron are very substantial on its surrounding community.

Economic Impacts on Summit County Businesses

Model B-1 Summit County University-Related Business Volume: BV_{UR}

This model and its component models account for: (1) the direct purchases made by The University of Akron and its faculty, administrators, staff, students and visitors from Summit County businesses, $(E_{SC})_{UR}$; (2) the "second round" purchases from county sources by county businesses in support of their university-related business volume, $(P_{SCB})_{UR}$, as shown in

Model B-1.2; and (3) the amount of county business volume that is stimulated by the expenditure of university-related income by individuals other than faculty, administrators, staff, and students, $(BV_I)_{UR}$, as shown in Model B-1.3. The multipliers selected for use in Models B-1.2 and B-1.3 are $m_p = 0.15$ and $m_l = 0.60$, respectively. Since The University of Akron is an urban institution, these parameter values are at the minimum of the range given by Caffrey and Isaacs (1971).

The overall multiplier is the sum, $(1 + m_p + m_l)$, and its value in this study is 1.75. By contrast, prior economic impact studies of sister institutions use differing values. For example, a Kent State University study (1973) used a value of 1.09. Cleveland State University's study (1992) used a value of 1.4. An earlier University of Akron study (1981) used a multiplier value of 2.7.

$$BV_{UR} = (E_{SC})_{UR} + (P_{SCB})_{UR} + (BV_I)_{UR}$$
$$\$222{,}080{,}430 = \$126{,}903{,}103 + \$19{,}035{,}465 + \$76{,}141{,}862$$

B-1.1 Summit County University-Related Expenditures: $(E_{SC})_{UR}$

This model is the summation of the direct purchases made by The University of Akron, $(E_{SC})_U$, and its faculty, administrators, staff $(E_{SC})_{FAS}$, students $(E_{SC})_{ST}$ and visitors $(E_{SC})_V$.

$$(E_{SC})_{UR} = (E_{SC})_U + (E_{SC})_{FAS} + (E_{SC})_{ST} + (E_{SC})_V + (E_{SC})_{PT}$$
$$\$126{,}903{,}103 = \$15{,}802{,}856 + \$17{,}951{,}675 + \$69{,}394{,}336 + \$3{,}513{,}362 + \$20{,}240{,}874$$

B-1.1.1 Summit County Expenditures by The University of Akron: $(E_{SC})_U$

The total expenditure for the purchase of goods and services by The

University of Akron, (E_U), for fiscal year 1991-1992 was $200,271,548. Since they are considered elsewhere and are not considered in this section, the wages and salaries of faculty, administrators, staff and students, (W_{FASST}), for the period was $101,234,159. Since they are not external purchases, interdepartmental charges within and between colleges, (XF_U), for their respective share of joint services are not included. Further, insurance and pension payments are excluded. Since they are not purchases, taxes and other payments to governments, (SC_U), were $16,257,116 and are excluded. Payments to banks are not included because most are merely transfers.

Unlike other studies, this one does not calculate the proportion of purchases made from Summit County businesses, $(e_{SC})_U$. Rather, the total payments that were made to outside vendors in fiscal year 1991-1992 was $46,724,648. From this amount, the amount of $15,802,856 was paid to venders that possessed a Summit County postal zip code.

$(E_{SC})_U = \$15,802,856$

B-1.1.2 Summit County Expenditures by Faculty, Administrators and Staff: $(E_{SC})_{FAS}$

This sub-model estimates the dollar volume of Summit County purchases of personal goods and services by the members of the university's faculty, administration and staff, $(E_{SC})_{FAS}$. Understatement occurs because payments: (1) to real estate brokers; (2) for mortgage interest and fees paid to bankers; and (3) of insurance premiums on owner-occupied dwellings are not considered. Also, any imputed rent for owner-occupied dwellings is not calculated.

Although somewhat inconsistent with Model B-3's inclusion of time deposits, income is assumed to equal expenditures. All income received is spent with none left for savings and no net borrowing exists. Another assumption implicit in this model is that there exists no other income sources, such as: a second wage earner in the household, dividends, royalties, or family business profit. Also, the underlying assumption is that income received by the population of Summit County is representative of faculty, administration and staff income.

$$(E_{SC})FAS = (E_{H})FAS + (E_{NH})FAS + (E_{SC})NSCFAS$$

$$\$17{,}951{,}675 = \$4{,}484{,}405 + \$12{,}290{,}649 + \$1{,}176{,}621$$

B-1.1.2.1 Summit County Expenditures by Faculty, Administrators and Staff for Rental Housing: $(E_{H})FAS$

This model considers the annual housing expense of university employees who rent housing in Summit County. Those employees who own their own homes are considered as part of the value of Summit County real estate related to the university and are accounted for in another section of this paper. Due to differences in the proportion who reside inside Summit County (f_{SCi}), university personnel were stratified into three employee groups. The proportion of each category of employee who rents housing, (f_{Hi}), is assumed to equal the ratio obtained from the 1990 census for Summit County. The proportion of an employee's total expenditures likely to be spent on rent, (e_{Hi}), is set equal to the percentage of consumer rental expenditure for the Cleveland Metropolitan Statistical Area. Due to differences in mean aggregate annual disposable income, (DI_i), university personnel were stratified into three employee groups: F: faculty , A: administrators and librarians; and S: staff. The mean disposable income for each class is the product of the number of employees times the average salary per employee class.

$(E_H)_{FAS} = (E_H)_F + (E_H)_A + (E_H)_S$

$\$4,484,405 = \$2,252,847 + \$704,955 + \$1,526,603$

$(E_H)_F = (f_{SCF})\ (f_{HF})\ (e_{HF})\ (DI_{SCF})$

$\$2,252,847 = (0.74)\ (0.3128)\ (0.311)\ (\$31,289,545)$

$(E_H)_A = (f_{SCA})\ (f_{HA})\ (e_{HA})\ (DI_{SCA})$

$\$704,955 = (0.72)\ (0.3128)\ (0.311)\ (\$10,065,300)$

$(E_H)_S = (f_{SCS})\ (f_{HS})\ (e_{HS})\ (DI_{SCS})$

$\$1,526,603 = (0.81)\ (0.3128)\ (0.311)\ (\$19,373,760)$

B-1.1.2.2 Summit County Non-housing Expenditures by Faculty, Administrators and Staff: $(E_{NH})_{FAS}$

This model considers the annual purchase of goods and services by university employees in Summit County. Employee groups have been stratified to provide a more accurate estimate. The proportion of total non-housing expenditure that an employee is likely to make in Summit County, (e_{SC}), is a function of the gravity theory approach to retail sales. In this study, the Caffrey and Isaacs urban value is assumed to be the valid gravity measure. The proportion of employees who reside in Summit County, (f_{SCi}), was obtained from personnel records. The proportion of a consumer's total expenditure that is spent on non-housing items, $(e_{NH})_i$, is complement to the consumer expenditure survey value for rental expenses in the Cleveland Metropolitan Statistical Area. Aggregate disposable income, (DI_i), where i represents F: faculty; A: administrators and librarians; and S: staff, is the product of the average salary for each group of employees times the number of employees in each group.

$$(E_{NH})_{FAS} = (E_{NH})_{F} + (E_{NH})_{A} + (E_{NH})_{S}$$

$$\$12{,}290{,}649 = \$6{,}173{,}922 + \$1{,}932{,}366 + \$4{,}184{,}361$$

$$(E_{NH})_{F} = (f_{SCF})\ (e_{NH})_{F}\ (e_{SC})\ (DI_{SCF})$$

$$\$6{,}173{,}922 = (0.74)\ (0.689)\ (0.387)\ (\$31{,}289{,}545)$$

$$(E_{NH})_{A} = (f_{SCA})\ (e_{NH})_{A}\ (e_{SC})\ (DI_{SCA})$$

$$\$1{,}932{,}366 = (0.72)\ (0.689)\ (0.387)\ (\$10{,}065{,}300)$$

$$(E_{NH})_{S} = (f_{SCA})\ (e_{NH})_{S}\ (e_{SC})\ (DI_{SCS})$$

$$\$4{,}184{,}361 = (0.81)\ (0.689)\ (0.387)\ (\$19{,}373{,}760)$$

B-1.1.2.3 Summit County Non-Housing Expenditures by Non-Summit County Faculty, Administrators and Staff: $(E_{SC})_{NSCFAS}$

Summit County expenditures made by employee non-residents is a result of several factors. The number of non-Summit County residents was obtained from university personnel records and is written as the complement to the proportion of the employee group of Summit County residents, $(1 - f_{SCi})$. The estimated mean local expenditures by each employee who resides outside of Summit County, $(E_1)_i$, is assumed to be equal to the results obtained from the University of Virginia study. By comparison, the consumer expenditure survey indicates that 6.3% of income is food eaten away from home, transportation accounts for 19.1 percent, with health care, entertainment, and apparel being 16 percent of income. Thus, conservatively this study under represents the mean expenditures. The proportion of income spent is multiplied by the respective number of each category of employee.

$$(E_{SC})_{NSCFAS} = (E_{NSC})_F + (E_{NSC})_A + (E_{NSC})_S$$

$$\$1{,}176{,}621 = \$654{,}077 + \$226{,}590 + \$295{,}954$$

$$(E_{NSC})_F = (1 - f_{SCF})\ (F)\ (E_1)_F$$

$$\$654{,}077 = (0.26)\ (827)\ [(0.0804)(\$37{,}835)]$$

$$(E_{NSC})_A = (1 - f_{SCA})\ (A)\ (E_1)_A$$

$$\$226{,}590 = (0.28)\ (350)\ [(0.0804)(\$28{,}758)]$$

$$(E_{NSC})_S = (1 - f_{SCS})\ (S)\ (E_1)_S$$

$$\$295{,}954 = (0.19)\ (1{,}008)\ [(0.0804)(\$19{,}220)]$$

B-1.1.3 Summit County Expenditures by Students: $(E_{SC})_{ST}$

This model attempts to estimate the total Summit County expenditures by students who enroll at the university. Student economic behavior varies widely, in part, because as a urban university we attract a diverse student body. The behavioral assumption, based on results observed in previous economic impact studies, is that the expenditure pattern of a student rises as the level of university education increases. Graduate students tend to spend twice as much per year as what a first year student spends.

Student budgetary data, such as funds for books and supplies, personal items, entertainment, transportation), are based on nationwide surveys and serve as guidelines of student expenditures. This national data is used for school officials in allocating scholarships, student loans, and other form of financial aid. It should be representative of the levels of expenditures by students. Admittedly, these figures do not show the actual amount of funds spend in the local economy. Any rule of thumb used by the author in the calculation was compared to information obtained from a convenience sample of his students.

$$(E_{SC})_{ST} = (E_M)_{ST} + (E_H)_{ST} + (E_{NH})_{ST} + (E_{NH})_{NSCST} + (E_{SCG})_{ST}$$

$$\begin{aligned}\$69{,}394{,}336 = {} & \$13{,}955{,}250 + \$12{,}664{,}638 + \$7{,}461{,}090 \\ & + \$31{,}855{,}706 + \$3{,}457{,}652\end{aligned}$$

B-1.1.3.1 Summit County Miscellaneous Non-University Expenditures by Students Living in University Housing or with Parents: $(E_M)_{ST}$

The first category includes students, $(S_{UH})_{STi}$, who live in university housing, such as residence halls and apartments, and students who live at home with parents or relatives, $(S_{WP})_{STi}$. The proportion of total non-university expenditures, exclusive of room and board, that a student is likely to spend in Summit County is shown as $(e_{SC})_{STi}$. The mean per capita miscellaneous non-university expenditure made by the student is represented by $(E_m)_{STi}$. In all variables, i equals G for graduate student and U for undergraduate student.

$$(E_M)_{ST} = (E_M)_{STG} + (E_M)_{STU}$$

$$\$13{,}955{,}250 = \$1{,}006{,}560 + \$12{,}948{,}690$$

$$(E_M)_{STG} = (S_{WP})_{STG}\,(e_{SC})_{STG}\,(E_m)_{STG}$$

$$\$1{,}006{,}560 = [(2328)(0.2)]\ (0.80)\ (\$2700)$$

$$\begin{aligned}(E_M)_{STU} = {} & (S_{UH})_{STU}\,(e_{SC})_{STU}\,(E_m)_{STU} \\ & + (S_{WP})_{STU}\,(e_{SC})_{STU}\,(E_m)_{STU}\end{aligned}$$

$$\begin{aligned}\$12{,}948{,}690 & = \$4{,}243{,}500 + \$8{,}705{,}190 \\ & = (2050)\ (0.90)\ (\$2300) + (3939)\ (0.85)\ (\$2600)\end{aligned}$$

B-1.1.3.2 Summit County Expenditures by Students for Summit County Rental Housing: $(E_H)_{ST}$

This model is the product of the "rule of thumb" number of graduate, law and undergraduate students that rent housing in Summit County, (S_H), times the expected per capita housing expenditures, (E_h), as estimated by university financial assistance (Cost of Education, April 24, 1992).

$$(E_H)_{ST} = [(S_H)_G + (S_H)_U] (E_h)$$

$$\$12,664,638 = [846 + 2787] (\$3486)$$

B-1.1.3.3 Summit County Non-Housing Expenditures by Students Who Rent or Own Housing in Summit County: $(E_{NH})_{ST}$

This model is the sum of the product of the number of students that do not reside on campus or with parents or relatives in Summit County, (S_H) times the mean per capita non-housing expenditures $(E_{nh})_{STi}$ times the proportion of total expenditures, exclusive of room and board, that a student is likely to make in Summit County $(e_{SC})_{ST}$.

$$(E_{NH})_{ST} = (E_{NH})_{STG} + (E_{NH})_{STU}$$

$$\$7,461,090 = \$1,692,000 + \$5,769,090$$

$$(E_{NH})_{STG} = (S_{HG}) (e_{SC})_{STG} (E_{NH})_{STG}$$

$$\$1,692,000 = (846) (0.80) (\$2500)$$

$$(E_{NH})_{STU} = (S_{HU}) (e_{SC})_{STU} (E_{NH})_{STU}$$

$$\$5,769,090 = (2787) (0.90) (\$2300)$$

B-1.1.3.4 Summit County Expenditures by Non-Summit County Students on Goods and Services in Summit County: $(E_{SC})_{NSCST}$

The expenditures in the county by non-county students is estimated by multiplying the number of out-of-county students, (S_{NSCSTi}), by the estimated mean expenditures by the student, $(E_i)_{STi}$. Where i equals G for graduate, law and post-bachelor and U for undergraduate student, respectively.

$$(E_{NH})_{NSCST} = (E_{NH})_{NSCSTG} + (E_{NH})_{NSCSTU}$$

$$\$31{,}855{,}706 = \$13{,}975{,}506 + \$17{,}880{,}200$$

$$(E_{NH})_{NSCSTG} = (S_{NSCSTG})\,(E_I)_{NSCSTG}$$

$$\$13{,}975{,}506 = [338(\$7123) + 1867(\$6196)]$$

$$(E_{NH})_{NSCSTU} = (S_{NSCSTU})\,(E_I)_{NSCSTU}$$

$$\$39{,}958{,}360 = (7774)\,(\$5140)$$

B-1.1.3.5 Summit County Expenditures by Fraternities, Sororities or Other Living Groups: $(E_{SCG})_{ST}$

The total expenditures, $(E_{SCG})_{ST}$, made by those who reside in group living situations consists of the rent paid by the 323 students who reside in Greek housing and the students who live in two companies' private residence halls, $(E_{SCGH})_{ST}$. Although there exist 800 beds in the private residence halls, only 150 are occupied. To this value, the product of the proportion of non-housing expenditures made in Summit County by these living groups, $(e_{SCGNH})_{ST}$, times the estimated inflation adjusted operating and food expenditures made by persons residing in living groups, $(E_{SCGO})_{ST}$, is added. Estimated expenditures were obtained from the 1986 Diary Survey, Bureau of Labor Statistics. They were adjusted by the implicit price deflator for personal consumption expenditures.

$$(E_{SCG})_{ST} = (E_{SCGH})_{ST} + (e_{SCGNH})_{ST}\,(E_{SCGO})_{ST}$$

$$\$3{,}457{,}652 = \$1{,}070{,}570 + (0.90)\,[(723)(\$3{,}668{,}483)]$$

B-1.1.4 Summit County Expenditures by Visitors to the University: $(E_{SC})_V$

Generally, there are four types of visitors to a university campus. These are: business (e.g. guest lectures, textbook salespersons), recreational (e.g. sports, theater), educational (e.g. conferences and seminars), and personal (e.g. parents and friends). The Caffrey and Isaacs' model treats part-time students as visitors. For an urban campus, such as ours, this presumption does not do justice to our mission. However, in order to facilitate comparisons, part-time students are covered in this section.

Since visitors to the University campus are more diverse, in order to facilitate data collection, certain assumptions were made about university services. All calculations based on these assumptions are significantly smaller in value than indicated in corresponding studies. This conservatism is in keeping with the principle of enhancing the value of the study by understating the actual impact of the university on its community. All categories are listed even if an actual dollar amount can not be accurately be ascribed.

$(E_{SC})_v = \$3,513,362$

E. J. Thomas Performing Arts Hall

Total university expenditures were $2,273,998 for fiscal year 1991-1992. If the average ticket price was $20, the number of visitors was 113,670. Further, if only ten percent of these visitors were from outside Summit County and if they only spent $20 per day while visiting, then $227,340 was generated.

Graduation

University records indicate that 0.5166 of the student population are not residents of Summit County. If the university graduates only 1,000 students per calendar year and each student has parents, family and friends that cumulatively spend $20 per graduation in Summit County, $10,340 was generated.

Athletics and Rubber Bowl

Total expenditure for sports and stadium was $5,689,011. If the average price per ticket was $10, then 568,901 people were involved in attendance. If ten percent were not residents of Summit County and they spent an average of $20 per day per visitor, an additional $1,137,802 was generated.

Gardner Student Center

This facility has a theater and game room. For our purposes, let's assume only $100 was generated in these and any other special activities held in this facility.

Student Visitors

Students normally have visitors during the course of the academic year. If we assume that fifty percent of the students who live in university residence halls, Greek houses, private residence halls, and in apartments situated near campus have 1.5 day visitors per year per student and each visitor spends an average of $10 per day, then $48,420 was generated. Further, if half of the students residing on campus and in its surrounding area had 1.5 visitors per year per student stay overnight in Summit County and spend $20 per day, then $242,100 was generated.

Educational Visitors

Business Visitors

Part-Time Students

University records indicate that 11,848 students enrolled during Fall Semester, 1991, and had registered for 66,442 credit hours. Approximately 63 percent of undergraduate part-time students who represent 80 percent of the registered credit hours were not from Summit County. Let's assume that all of these students would have enrolled elsewhere in the absence of the university. If they spend $5 per week in Summit County for a thirty two week academic year, then $1,895,680 was generated. Undoubtedly, many of the 5,995 undergraduate Summit County residents would have to have pursued their education elsewhere. If the graduate and law student data were available, an approximation could be made for them also.

B-1.1.5 Summit County Expenditures by University Part-Time Employees: $(E_{SC})_{PT}$

During the 1991-1992 fiscal year, the main campus payroll included wages for part-time faculty, staff, graduate assistants, and student assistants. Adhering to the proportions used in earlier sections of this model, the calculations are based on the presumption that part-time employees live and spend their wages in the same manner as their respective full-time colleagues.

$$(E_{SC})_{PT} = F_{PT} + S_{PT} + G_{PT} + SA_{PT}$$

$$\$20{,}240{,}874 = \$5{,}164{,}442 + \$1{,}185{,}810 + \$8{,}092{,}274 + \$5{,}798{,}348$$

B-1.2 Purchases from Summit County Sources by Businesses in Support of their University-Related Business Volume: $(P_{SCB})_{UR}$

Any purchase by The University of Akron or its faculty, administrators, staff, students or visitors sets off a round of economic transactions. The initial dollar will be spent many times and can reappear as income to Summit County merchants. This second round purchases from county sources by county businesses in support of their university-related business volume is stimulated by the expenditure of university-related income by individuals other than the university or its faculty, administrators, staff, and students.

Summit County contains 514,990 people. Its largest city, Akron, is a medium-sized city with a population of 223,019. The county business firms are a diversified in a well-developed economic base. Thus, the multiplier values used in estimating Summit County's economic relationships are .

From Model B-1.1, we obtain the value for university-related expenditure, $(E_{SC})_{UR}$. The coefficient, m_p, is the additional value of Summit County production that is generated by an additional one dollar that is spent by Summit County households in Summit County establishments. It represents the degree to which county businesses purchase goods and services from other county businesses. As indicated in Table Eight, the value selected as being representative of the urban university is the smallest recommended value from the Caffrey range. This value equals 0.15.

$(P_{SCB})_{UR} = (m_p)\ (E_{SC})_{UR}$

$\$19{,}035{,}465 = (0.15)\ (\$126{,}903{,}103)$

B-1.3 Business Volume Stimulated by the Expenditure of University-Related Income by Summit County Individuals Other Than Faculty, Staff, or Students: $(BV_I)_{UR}$.

This model is the second approach toward estimating the indirect effects of university-related business activity. This model estimates the amount of county business volume derived from previous county purchases that is stimulated by the expenditure of university-related income by individuals, $(E_{SC})_{UR}$. For example, county businesses share their receipts with county residents in the form of wages and salaries. Part of these funds will be spent in the county by its recipients for everyday spending. The multiplier, m_I, is defined as the income-induced requirements per one dollar of final demand. The income multiplier represents the proportion of income received from university-related business activity that is spent and spent over again on a county-wide basis. Its value, obtained from Table Eight, is 0.60.

$(BV_I)_{UR} = (m_I)\ (E_{SC})_{UR}$

$\$76{,}141{,}862 = (0.60)\ (\$126{,}903{,}103)$

Model B-2 Value of Business Property Committed to University-Related Business: $(PR_B)_{UR}$

This model serves to indicate the property and capital associated with the business activity that is generated by the presence of The University of Akron. Those portions of existing capital and property that relate to the flow of purchases initiated by university-related sales is accumulated into this model. It is the sum of the (1) value of regional business property committed to university-related business, $(RP_B)_{UR}$; (2) value of regional business inventory committed to university-related business, $(I_B)_{UR}$; and (3) value of county business non-real property committed to university-related business, $(OP_B)_{UR}$.

$$(PR_B)_{UR} = (RP_B)_{UR} + (I_B)_{UR} + (OP_B)_{UR}$$

$$\$152,834,013 = \$75,173,974 + \$20,720,104 + \$56,939,935$$

B-2.1 Value of Business Real Estate Property Committed to University-Related Business: $(RP_B)_{UR}$

This model estimates the dollar value of county business' property that is used to service university-related sales. It relies on the taxing district's assessed valuation of the property, V_B, not the market value one could receive if the property were to be sold nor the historical cost of the property. The assessed value is converted to approximate market value by adjusting it by the ratio of assessed to market value, amv. The ratio of assessed to market value for Summit County real estate is 0.35, 1.00 and 0.27 for business property, public utility personal property, and tangible personal property, respectively. In the table shown below, the fair market value of each of the respective State of Ohio property classifications is presented.

TABLE SIX

SUMMIT COUNTY REAL PROPERTY VALUES, 1991

State Classification	100% Valuation
Educational	721,713,542
Church and Charitable	578,937,686
Governmental	948,800,771
Business	4,640,368,760
Tangible Personal Property	3,514,810,812
Residential	10,360,687,563
Undeveloped (Mineral & Agricultural)	183,756,162
Summit County Total	20,949,065,296

From Model B-1, we use the value of business volume from university-related influence, BV_{UR}, and adjust it by total Summit County business volume, BV_{SC}. From the U.S. Bureau of the Census, total Summit County business volume is obtained. Those firms that are subject to federal income tax withholding are the defined population. These censuses are performed every five years. The most recent census was completed in 1987.

TABLE SEVEN

SUMMIT COUNTY BUSINESS VOLUME, 1987

Business	Dollar Volume	Number Firms
Total Retail Sales	3,203,053,000	3,181
Total Wholesale Sales	6,855,588,000	999
Manufacturing	2,341,600,000	978
Services	1,269,382,000	3,601
Business Volume	$13,669,623,000	8,759

$(RP_B)_{UR} = \{(BV_{UR})/(BV_{SC})\}\ (V_B)$

$\$75,173,974 = \{\$222,080,430/\$13,669,623,000\}\ \{\$4,640,368,760\}$

B-2.2 Value of Business Inventory Committed to University-Related Business: $(I_B)_{UR}$

This model is used to calculate the value of business inventory necessary to support university-related business. This inventory value is the product of university-related business volume from Model B-1, BV_{UR}, with Summit County's inventory-to-business ratio, ibv. The inventory-to-business volume ratio is the total value for inventory ($879,318,508) divided by business receipts ($9,427,277,533) for those corporations that filed with the U.S. Internal Revenue Service for the year ended June 30, 1990. The Summit County inventory-to-

business volume ratio is assumed to equal the federal values.

$$(I_B)_{UR} = (ibv)\ (BV_{UR})$$

$$\$20{,}720{,}104 = (0.0933)\ (\$222{,}080{,}430)$$

B-2.3 Value of Business Property, Other Than Real Property and Inventory, Committed to University-Related Business: $(OP_B)_{UR}$

Generally, this business property will consist of manufacturer's machinery and equipment. It is estimated from the value of regional business property other than real estate and inventory, OP, times the ratio of regional business volume from Model B-2.1, BV_{SC}, to the total value of university-related business volume from Model B-1, BV_{UR}.

$$(OP_B)_{UR} = (OP)\ \{BV_{SC}/BV_{UR}\}$$

$$\$56{,}939{,}935 = \$3{,}514{,}810{,}812\ \{\$222{,}080{,}430/\$13{,}669{,}623{,}000\}$$

Model B-3 Expansion of Summit County Bank's Credit Base Resulting from University-Related Deposits: CB

Another secondary effect that occurs as a consequence of the economic activity of the university and its business suppliers, faculty, administrators, staff and students is the expansion of the credit base of Summit County. Except for a small required legal reserve, all monies on deposit in Summit County banks from the university and its constituencies are available to be used in making loans to members of the larger community. Since trust accounts are fully investable by banks, the University trust accounts are appended to this model. The mean dollar amount that the university has in its trust accounts, TA_U, is \$2,425,000. The total market value of securities, cash and other assets, as of June 30,

1992, of both The University of Akron and its associated foundation is $50,613,000. Also, the university averages $1,100,000 in an overnight repurchase agreement.

Banks operate on the fractional reserve principle. When a deposit is made, only a portion of these funds can be offered as loans to the surrounding community. The portion that can not be loaned, but must be set aside is the legal reserve minimum. For time, or savings, accounts, TD_i, the minimum reserve deposit requirement, t, had been 0.03. However, on December 27, 1990, banks have not been required to set aside funds to cover non-transaction accounts. For demand deposits on account, or checking accounts, DD_i the legal minimum demand deposit on account, d, remains dependent upon the size of the dollar amount. For up to $41,100,000, the reserve requirement, d_1 is 0.03. Over $41,100,000 the minimum amount to be reserved, d_2, equals 0.12. Effective after the date April 2, 1992, the cut-off amount increases to $42,200,000 and the larger percentage held in fractional reserve declines to 0.10 (Federal Reserve Bulletin).

Using the median salary of each group of employees, the estimated level of demand deposit on accounts, DD_i, and time deposits, TD_i, are calculated by multiplying the number of each class of employees who reside in Summit County by the proportion expected to possess an account and the average amount in the account. Both types of accounts are calculated in this manner using a survey of consumer finances (Kennickell and Shack-Marquez 1992). The subscript i indicates the university, U; faculty, F; administrators, A; staff, S; graduate assistants, GA; and student assistants, SA.

The business suppliers' portion of credit expansion equals the product of the university- related business volume, BV_{UR} from Model B-1, times the cash-to-business-volume ratio, cbv. The cash-to-business-volume ratio is the total cash divided by adjusted business receipts for those corporations that filed with the U.S. Internal Revenue Service for the year ended June 30, 1990.

This model does not include: (1) secondary or subsequent transactions and their expansive effect on available credit; (2) the effect of part-time faculty and staff ; and (3) any effects by 16,393 full time and 11,848 part-time graduate, law and undergraduate students.

$$CB = (\text{sum } TD_i) + (1 - d_2)(\text{sum } DD_i) + cbv\ (BV_{UR}) + TA_U$$

$$\$28{,}629{,}079 = (\$1{,}100{,}000) + (\$4{,}782{,}500) + (1 - 0.12)(\$1{,}036{,}078) \\ + (0.0874)\ (\$222{,}080{,}430) + \$2{,}425{,}000$$

Model B-4 Summit County Business Volume Unrealized Because of the Existence of University Enterprises: $(BV_U)_{UR}$

To the extent that it operates business enterprises, the university is in competition with other local firms. For example, dormitories and dining halls may be in competition with existing or potential off-campus housing and restaurant facilities. The operation of these auxiliary enterprises can be viewed as possessing a negative influence on the community and its economy. This model assumes that any funds expended in the university businesses are lost to Summit County. This may or may not be a valid claim. Also, the question about what might have been had the university not developed, or had more fully developed, its facilities is not answered here.

U.A. Auxiliary Enterprises:

Athletics and Rubber Bowl	**$5,506,389**
Student Housing:	**$8,696,818**
Residence Halls	
Housing Commission	
Robertson Dining Hall	
Gardner Student Center:	**$4,326,874**
Hilltop Food Service	
Food and Vending Commission	
Communications Center	
Game Room	
Rentals and Miscellaneous	
E.J. Thomas Performing Arts Hall:	**$1,453,575**
Shows and Rentals	
Concessions	
Other	
Parking System	**$2,572,846**

$$(BV_U)_{UR} = \$22,556,502$$

Economic Impacts on Governments

Model G-1 University-Related Revenues Received by Summit County Governments: R_{UR}

The second sector of the Summit County economy about which we are concerned is local government. This set of models is designed to show the effects of the presence of The University of Akron on Summit County governments' revenues and expenditures. While tempting to compare revenues with expenditures, it would be a misuse of these models to do so. A simple balance sheet does not contain many important, but non-quantifiable and intangible factors.

The Model G-1 looks at the revenues received by Summit County and its communities than can be said to be attributable to The University of Akron and its faculty, administrators, staff and students. Revenue sources include real estate taxes $(SC_{RE})_{UR}$; non-real property taxes $(SC_{NRE})_{UR}$; city income taxes, $(SC_{IT})_{UR}$; sales tax revenue received by Summit County Governments from university-related county purchases, $(SC_{AV})_{UR}$; state and federal aid and financial reimbursements $(SC_A)_{UR}$; and other university-related revenues collected by Summit County governments, $(SC_{Q})_{UR}$. If the current population differs significantly from the 1990 census, these models may be misstated.

$$R_{UR} = (SC_{RE})_{UR} + (SC_{NRE})_{UR} + (SC_{IT})_{UR} + (SC_{AV})_{UR} + (SC_{A})_{UR} + (SC_{Q})_{UR}$$

$$\$17{,}039{,}501 = \$4{,}545{,}976 + \$3{,}981{,}785 + \$2{,}024{,}683 + \$307{,}337 + \$5{,}981{,}956 + \$197{,}764$$

G-1.1 University-Related Real Estate Taxes Paid to Summit County Governments: $(SC_{RE})_{UR}$

This model estimates the annual receipt of real estate taxes by Summit County governments from the university, $(SC_{RE})_{U}$, and its faculty, administrators, staff, $(SC_{RE})_{F}$; student living groups, $(SC_{RE})_{ST}$ and business real property attributable to university-related influence, $(SC_{RE,B})_{UR}$.

$$(SC_{RE})_{UR} = (SC_{RE})_{U} + (SC_{RE})_{FAS} + (SC_{RE,B})_{UR}$$

$$\$4{,}545{,}976 = \$0 + \$2{,}246{,}780 + \$2{,}299{,}196$$

G-1.1.1 Real Estate Tax Assessments Paid by The University of Akron: $(SC_{RE})_{U}$

Inter-governmental tax immunity renders all University of Akron real property and its improvements, $(SC_{RE})_{U}$, non-taxable.

G-1.1.2 Real Estate Taxes Paid by Faculty, Administrators and Staff and Students in Group Living Situations: $(SC_{RE})_{FAS}$

This model indicates the real estate taxes received by local governments from the presence of The University of Akron. We assume that the number of faculty, administrative and staff who live in Summit

County, FAS_{SC}, live in housing of median value. Since the number of university faculty, administration and staff have been stable, it could be possible that these employees collectively reside in housing the may be higher than the median value. To this extent, we understate the impact of property tax revenue.

The proportion of faculty, administration and staff who own homes in Summit County, (f_O), equals the complement of the proportion of the employees who rent housing, ($1 - f_{HI}$). Recall, the proportion of employee renters was assumed equal to the proportion found in the most recent decennial population census and can be located in Model B-1.1.2.1. The product of the number of employees who live in Summit County and the proportion who own homes is multiplied against the mean effective property tax per private residence, pt. In Ohio, House Bill 920 reduction factors need to be considered in calculating the effective property tax rate. The mean assessed valuation is the quotient of total valuation of Summit County private residences, V_{PR}, and the total number of Summit County private residences, N_{PR}, as of December 31,1991. The number of private residences is not identical to the U.S. Census' number of households.

Since many full-time students are unlikely to own their own home, they have been excluded from further consideration. Thereby, potentially understating its results. However, we do include the dollar value of estimated property taxes paid by students who reside in Greek system housing, $(SC_{RE})_{ST}$. This figure is the product of the median effective property tax rate times the number of non-university owned residences.

$$(SC_{RE})_{FAS} = \{(FAS_{SC})\ (f_O)\}\ \{pt(V_{PR}/N_{PR})\} + (SC_{RE})_{ST}$$

$$\$2{,}246{,}780 = \{(1{,}680)(0.6872)\}\ \{(0.030585)(\$10{,}360{,}687{,}563/164{,}733)\} + (\$26{,}931)$$

G-1.1.3 Real Estate Taxes Paid by Summit County Businesses for Real Property Attributable to University-Related Business: $(SC_{RE,B})_{UR}$

Since a portion of business real property is committed to university-related business, a portion of real estate taxes are attributable to the presence of the university. Therefore, to obtain the proportion of business volume that is university- related divide county business volume of the university from Model B-1, BV_{UR}, by total county business volume from Model B-2.1, BV_{SC}. This proportion is multiplied by both the county property tax rate from Model G-1.1.2, pt, and the fair market valuation of county business real property from Model B-2.1, V_B.

$$(SC_{RE,B})_{UR} = (BV_{UR}/BV_{SC})\ (V_B)\ (pt)$$

$$\$2,299,196 = \{\$222,080,430/\$13,669,623,000\}\ \{(\$4,640,368,760)(0.030585)\}$$

G-1.2 University-Related Property Taxes, Other Than Real Estate, Paid to Summit County Governments: $(SC_{NRE})_{UR}$

This model focuses on the payment of property taxes to Summit County governments as a consequence of the university. Sums the non-real property taxes paid to Summit County governments by all university employees and by businesses for non-real property attributable to university-related business volume. Non-real property taxes generally are collected through: (1) motor vehicle taxes, $(SC_{NRE,MV})_{UR}$; (2) manufacturers' machinery and equipment taxes, $(SC_{NRE,MM})_{UR}$; and (3) property taxes, other than for real estate and machinery and equipment, $(SC_{NRE,PP})_{UR}$.

$$(SC_{NRE})_{UR} = (SC_{NRE,MV})_{UR} + (SC_{NRE,PP})_{UR}$$

$$\$3,981,785 = \$118,410 + \$3,863,375$$

G-1.2.1 Motor Vehicle Taxes Attributable to University-Related Influences: $(SC_{NRE,MV})_{UR}$

This model estimates the value of motor vehicle taxes, such as: automobile registration and license fees, paid to Summit County governments. The total number of university employees that is adjusted for the number of student university employees is added to the total number of students, SC_{ST}. The number of employees and students is multiplied by the ratio of total motor vehicle revenue received by Summit County governments, R_{SC}, to the total population of Summit County, POP_{SC}. The university is exempt from this tax for its vehicles.

$$(SC_{NRE,MV})_{UR} = [FAS_{SC} + SC_{ST}]\ (R_{SC}/POP_{SC})$$

$$\$118,410 = [1680 + 5995]\ (\$7,945,244/514,990)$$

G-1.2.2 Tangible Personal Property Taxes Attributable to University-Related Influences: $(SC_{NRE,PP})_{UR}$.

This model estimates the revenue received by governments in Summit County as a result of assets, other than for real property and machinery and equipment, that are attributable to university-related influences. The product of the tangible and personal property tax rate, ppt, and the total fair market valuation of county tangible and personal property as of 12/31/1991, V_{PP}, is multiplied by the relative university-related business volume. As shown in Model G-1.1.3, the proportion of Summit County business volume that is university-related is BV_{UR}/BV_{SC}.

$$(SC_{NRE,PP})_{UR} = (BV_{UR}/BV_{SC})\ (V_{PP})\ (ppt)$$

$$\$3,863,375 = (\$222,080,430/\$13,669,623,000)\ (\$3,514,810,812)(0.06785)$$

G-1.3 City Income Tax Revenue Received by Summit County Governments: $(SC_{IT})_{UR}$

This model reflects the two percent (2%) City of Akron income tax that is levied on all of The University of Akron employees earned income, W_{FASST}.

$(SC_{IT})_{UR} = (0.02)\ (W_{FASST})$

$\$2,024,683 = (0.02)\ (\$101,234,159)$

G-1.4 Sales and Use Tax Revenue Received by Summit County Governments from University-Related County Purchases: $(SC_{AV})_{UR}$

Governments in Summit County levy their own sales and use, or ad valorem, taxes. These taxes are levied on retail sales and on gasoline purchases. This model estimates the sales tax revenues received by the various governments within the county. University-related local sales tax is the proportion of business volume, from Model G-1.1.3 (BV_{UR}/BV_{SC}), times the total sales tax collected in Summit County during calendar year 1991, SC_{TST}.

$(SC_{AV})_{UR} = (BV_{UR}/BV_{SC})\ (SC_{TST})$

$\$307,337 = (\$222,080,430/\$13,669,623,000)\ (\$18,971,435)$

G-1.5 University-Related State Aid and Other Financial Reimbursements Paid to Summit County Governments: $(SC_{A})_{UR}$

This model summarizes all other revenues received by county governments attributable to the presence of The University of Akron. Some revenues are educational aid from the state and federal governments, $(SC_{A,E})_{UR}$. Others are non-educational and are based on population, $(SC_{A,NE,P})_{UR}$, and property taxes, $(SC_{A,NE,PR})_{UR}$.

$$(SC_{A})_{UR} = (SC_{A,NE,P})_{UR} + (SC_{A,NE})_{UR} + (SC_{AO,E})_{UR} + (SC_{AF,E})_{UR}$$

$$\$5,981,956 = \$1,040,055 + \$1,606,223 + \$3,043,587 + \$292,091$$

G-1.5.1 State Aid and Other Financial Reimbursements Based on Population Attributable to University-Related Influences: $(SC_{A,NE,P})_{UR}$

This model estimates county revenues received from the State of Ohio based on population. For instance, Summit County receives a per capita share of Ohio alcoholic beverage taxes, OSC_P. Where the variable, FH_{SC}, represents the number of related persons living in faculty, administration and librarian, and staff households. The variable, SFH_{SCj}, stands for the estimated number of related persons living in student households. U. S. Census data indicate that 1990 population of Summit County, POP_O, is 514,990.

$$(SC_{A,NE,P})_{UR} = OSC_P \{(FH_{SC} + SFH_{SC})/POP_O\}$$

$$\$1,040,055 = \$650,034,528 \{(4,862, + 12,559)/10,847,115\}$$

G-1.5.2. State Aid and Other Financial Reimbursements Attributable to University-Related Influences: $(SC_{A,NE})_{UR}$

This model serves to identify the amount of state aid for other than education, OSC_P, collected by Summit County governments as a consequence of university influences. In the State of Ohio, each county possesses an undivided local government fund and a government assistance fund. The state government allocates a statutory percentage to these funds from its collection of the state income tax, sales and use tax, public utility tax, the corporate franchise tax, and a dealers-in-intangibles tax. Summit County governments also receive a return of state collected taxes for the library and motor vehicle fuel tax. Locally collected taxes include a real property transfer tax and licenses and permit fees. The amount received cumulatively for these taxes and fees is shown below.

$$(SC_{A,NE})_{UR} = OST_{SC} \{(FH_{SC} + SFH_{SC})/POP_{SC}\}$$

$$\$1,606,223 = \$47,521,387 \{(4,862, + 12,559)/514,990\}$$

G-1.5.3 State Aid to County Governments for Education Attributable to University-Related Influences: $(SC_{A,E})_{UR}$

This model estimates the amount of state aid for education received by regional governments attributable to the presence of the university. It assumes that total state aid to county public schools, A_{PS} equals the percent raised by the state, T_{OLE}, times the operating and capital budget costs of county public school education, B_{PSS} This state aide is multiplied by the quotient of the sum of the number of children from university employee households, $(CH_{PS})_{FAS}$, with the estimated number of children from university student households, $(CH_{PS})_{ST}$, by the number of students in county public schools, CH_{PS}.

$$(SC_{AO,E})_{UR} = (A_{PS})(T_{OLE}) \{(CH_{PS})_{FAS} + (CH_{PS})_{ST}\}/CH_{PS}$$

$$\$3,043,587 = (\$191,420,584) \{(1,036 + 260)/81,375\}$$

G-1.5.4 Federal Aid to County Governments for Education Attributable to University-Related Influences: $(SC_{AF,E})_{UR}$

This model estimates the amount of federal aid for education received by regional governments attributable to the presence of the university. It assumes that total federal aid to county public schools, A_{FPS} equals the percent paid by the federal government, T_{US}, times the operating and capital budget costs of county public school education, B_{PSS} This federal aide is multiplied by the quotient of the sum of the number of children from university employee households, $(CH_{PS})_{FAS}$, with the estimated number of children from university student households, $(CH_{PS})_{ST}$, by the number of students in county public schools, CH_{PS}.

$$(SC_{AF,E})_{UR} = (A_{PS})(T_{US})\ \{(CH_{PS})_{FAS} + (CH_{PS})_{ST}\}/CH_{PS}$$

$$\$292{,}091 = (\$18{,}370{,}494)\ \{(1{,}036 + 260)/81{,}375\}$$

G-1.6 Other University-Related Revenues Collected by Summit County Governments: $(SC_Q)_{UR}$

This model is the "catch-all." It includes any revenue payable to any local government not specifically cited. Such items as, user charges for public utilities, sewers, trash, recycling, license fees and permits required of the university, and assessment charges paid by the university through its general and auxiliary funds.

$$(SC_Q)_{UR} = \$197{,}764$$

Model G-2 University-Related Revenues Received by the State of Ohio: SR_{UR}

This model is a cumulative indication of the revenues received by the State of Ohio that are attributable to university-related influences, SR_{UR}. Revenues are recorded as population taxes, $(SR_{PT})_{UR}$; income taxes, $(SR_{IT})_{UR}$; and business taxes, $(SR_{BT})_{UR}$.

$SR_{UR} = (SR_{PT})_{UR} + (SR_{IT})_{UR} + (SR_{BT})_{UR}$

$\$51,448,456 = \$36,130,304 + \$2,176,534 + \$13,141,618$

G-2.1 State Government Population Taxes Attributable to University-Related Influences: $(SR_{PT})_{UR}$

This model calculates the amount of state population taxes attributable to the presence of the university. Population taxes, such as: a motor vehicle tax, gasoline tax, and tobacco product tax, are, by their nature, equally regressive for all. Hence, the number of related persons living in university employee households in Summit County, $FASH_{SC}$, is added with the number of related persons that are living in university student households, STH_{SC}, and this sum is divided by the total population in the State of Ohio, POP_O. This quotient is multiplied by the state population taxes collected during the fiscal year ending June 30, 1991, SR_{PT}.

$(SR_{PT})_{UR} = \{(FASH_{SC} + STH_{SC})/POP_O\}\ SR_{PT}$

$\$36,130,304 = \{(4862 + 12,559)/10,847,115\}\ (\$1,068,943,901)$

G-2.2 State Income Tax Attributable to University-Related Influences: $(SR_{IT})_{UR}$

To estimate the amount of State of Ohio income taxes attributable to university-related influences, the ratio of the total Ohio personal income tax revenue for the fiscal year ended on June 30, 1991, SR_{IT}, to total Ohio personal income for calendar year 1991, PI_S, is multiplied by the sum of the total university employee income before withholding that also includes the total graduate student income, W_{FASST}. By not including undergraduate income, this model serves to understate the university's impact on the State's revenues. To the extent that a spouse earns income,

or that royalties, rents, intellectual property fees, or other passive income are received, the relative impact is further understated.

$$(SR_{IT})_{UR} = (SR_{IT}/PI_S)\ W_{FASST}$$

$$\$2,176,534 = (\$4,211,533,000/\$196,050,000,000)\ (\$101,234,159)$$

G-2.3 State Business Tax Attributable to University-Related Influences: $(SR_{BT})_{UR}$

To estimate the total business taxes paid to the State of Ohio attributable to university-related influences, the proportion of business volume that is university-related, form Model G-1.1.3, is multiplied by the total business taxes paid to the State, SR_{BT}.

$$(SR_{BT})_{UR} = (BV_{UR}/BV_R)\ SR_{BT}$$

$$\$13,141,618 = (\$222,080,430/\$13,669,623,000)\ \$811,211,000$$

Model G-3: Operating Cost of Summit County Government-Provided Municipal and Public School Services Attributable to University-Related Influences: $(OC_{M,PS})_{UR}$

This model accounts for Summit County governments' operating costs that are attributable to the university or its employees. The two major costs are: municipal services, $(OC_{MS})_{UR}$, and public school services, $(OC_{PSS})_{UR}$. Both are calculated on a population basis for allocating service costs. Since a university is far more labor intensive than most industrial business, this approach possesses the potential to overestimate the costs to university-related school and municipal services.

$$(OC_{M,PS})_{UR} = (OC_{MS})_{UR} + (OC_{PSS})_{UR}$$

$$\$35,509,249 = \$32,740,943 + \$3,768,306$$

G-3.1 Operating Cost of Government-Provided Municipal Services Attributable to University-Related Influences: $(OC_{MS})_{UR}$

Municipal services, other than public schools, provided by county area governments include: public safety, public works, sanitation, public health, and parks and recreation. These county services have an operating and capital budgets, B_{MS}. This figure is multiplied by the mean of the faculty, administrators, staff and students households from Model G-2.1 and the number of faculty, administrators, staff and students per Summit County capita. The number of faculty, administrators, staff and students is from Model B-3. This determination of the university-related population in the county weighs the number of households and number of employees and students equally.

$$(OC_{MS})_{UR} = B_{MS} \{0.5\ [(FASH_{SC} + STH_{SC}) + (F + S)]/POP_{SC}\}$$

$$\$32,740,943 = \{0.5\ [(4,862 + 12,559) + (1680 + 9743)]/514,990]\}$$
$$\$1,169,319,391$$

G-3.2 Operating Cost of Local Public Schools Attributable to University Related Influences: $(OC_{PSS})_{UR}$

This model estimates the amount of the operating costs of county public schools, B_{PSS}, exclusive of other county government operating costs, relative to the proportion of the children of the faculty, administrators, and staff plus the university's students, $(CH_{PS})_F$ + $(CH_{PS})_S$, to the total number of children enrolled in Summit County public schools, CH_{PS}. These figures are adjusted by the proportion of taxes that are raised locally, T_{LE}. This approach indicates the portion of county education operating costs that are attributable to university-related individuals. Since funding for elementary schools is generally greater than funding for middle or high schools, the age distribution of the

university-related household children and their respective educational cost needs to be known before complete accuracy is obtained. Also, there are eighteen school districts that are headquartered in Summit County. Some of these districts extend into surrounding counties. School districts from surrounding counties also extend into this county. The best available evidence indicates that the student head count from these overlapping districts completely offset each other.

$$(OC_{PSS})_{UR} = B_{PSS} \{[(CH_{PS})_{FAS} + (CH_{PS})_{ST}]/CH_{PS}\} T_{LE}$$

$$\$3{,}768{,}306 = \$471{,}038{,}309 \{[1{,}036 + 260]/81{,}375\} (0.502)$$

Model G-4: Value of Summit County Government Property Attributable to University-Related Portion of Educational and Municipal Services Provided: GP_{UR}

This model calculates the value of county government property used to support the municipal services and education that are provided to the university and the people who are associated with it. It is based on the Models G-4.1 and G-4.2. Two ratios are required. The first ratio, OC/B_{MS}, indicates the relative percentage of municipal service operating budgets that is university-related, $(OC_{MS})_{UR}/B_{MS}$. The second, OC/B_{PS} indicates the relative percentage of educational operating costs that are university-related, $(OC_{PSS})_{UR}/B_{PSS}$. The first ratio is multiplied against the value of all county governments' property, excluding public school property, GP_M. The second ratio multiplied against the value of all county public schools' property, GP_{PS}.

$$GP_{UR} = (OC/B_{MS})\, GP_M + (OC/B_{PSS})\, GP_{PS}$$

$$\$41{,}282{,}957 = (\$35{,}509{,}249/\$1{,}169{,}319{,}391)\ (\$948{,}800{,}771) + (\$3{,}768{,}306/\$471{,}038{,}309)\ (\$721{,}713{,}542)$$

Model G-5: Property Taxes Foregone Through the Tax-Exempt Status of The University of Akron: $(RF_{RE})_U$

Since the Caffrey and Isaac formulation equates building value to lot acre size, their model assumes that land and buildings are valued at the average value of the surrounding property. This practice is questionable because the 1978 University of Pittsburgh study calculated that local property values were increased by at least fifty two percent due to the presence of the university. As an urban institution we have been converting residential properties to commercial and with the Span-the-Tracks initiative the downtown property values have escalated. Thus, this study differs from the Caffrey and Isaacs model and uses balance sheet asset categories. Since property taxes would be assessed on real property, buildings and equipment, our somewhat erroneous assumption is that the book dollar value, as of June 30, 1991, equals the approximate fair market value of the university's property. To estimate the foregone property taxes, this book value of the three asset categories is multiplied by a tax rate factor. To permit comparisons, this study employs the tax rate factor and equipment depreciation (i.e. in the sixth year at $2.2%) used in the previous university impact study.

Category	Book Value	Tax Factor	Foregone Tax
Land	$16,804,815	0.0149	$250,392
Buildings	$219,970,005	0.0149	$3,277,553
Equipment	$102,294,035	0.0149	$643,204
Total	$239,068,855		$4,171,149

$(RF_{RE})_U$ = $4,171,149

Model G-6: Value of Municipal-Type Services Self-Provided by the University

This model calculates the value of municipal services which the university pays for itself that otherwise would have been paid by the governments of Summit County. These services consist of police and security salary and fringe benefits plus operating costs. In other studies, other costs are included, such as: street lighting, sanitation and trash removal, street maintenance, and other services.

$$(OC_M)_{SU} = \$1,602,673$$

Economic Impacts on Individuals

Model I-1: Number of Full-Time Jobs Attributed to the Presence of The University of Akron: J_{SC}

These models differ from the business and governmental models because they rely on the information obtained from these models. This model estimates the total number of jobs in Summit County attributable to the presence of The University of Akron as a state supported institution of higher education. The direct number of jobs, FAS, is calculated by subtracting the 1967 total of faculty, administration and staff positions from the 1992 total of all positions. The total county expenditure associated with the university is the sum of the total university-related expenditures from Model B-1.1, $(E_{SC})_{UR}$, and the operating costs of county provided municipal and public school services, $(OC_{M,PS})_{UR}$. Multiplying this sum by the number of local jobs per direct expenditures, j, one obtains the number of jobs resulting from the presence of the university. These resulting jobs plus the direct number of university jobs yields the total number of Summit County jobs attributable to the university. The multiplier effects are scaled to direct expenditures and the number of jobs from indirect expenditures are accounted for in this model.

$$J_{SC} = FAS_{1992} + j\,[(E_{SC})_{UR} + (OC_{M,PS})_{UR}]$$

$$15,178 = (2185) + (0.00008)(\$126,903,103 + \$35,509,249)$$

Model I-2: Personal Income of Individuals from University-Related Jobs and Business Activities: PI_{UR}

This model estimates the total personal income for county individuals from university-related jobs and business activity. It consists of the sum of two types of personal income. First type of income is the product of the proportion of faculty, administrators and staff that reside in Summit County, from Model B-1.1.2.1 (f_{SCi}), with the gross compensation of all faculty, administrators and staff, W_{FASST}. The second type of personal income is the product of the Summit County payroll and profits per dollar of direct expenditure in Summit County, from Table (p), times the university-related expenditures from Model B-1.1, $(E_{SC})_{UR}$.

$$PI_{UR} = (f_{SCi})(W_{FASST}) + (p)(E_{SC})_{UR}$$

$$\$149{,}541{,}761 = (0.76)(\$101{,}234{,}159) + (0.58)(\$126{,}903{,}103)$$

Model I-3: Durable Goods Procured with Income from University-Related Jobs and Business Activities: DG_{UR}

This model estimates the dollar value of durable goods procured with income from university-related jobs and business activities. It is the product of the personal income of county individuals from university-related jobs and business activities from Model I-2, $(PI)_{UR}$ with the proportion of income used in purchasing durable goods. The proportion of total income used to purchase durable goods, i, is defined to be the proportion of total wage and salary income that is used to purchase durable goods, such as motor vehicle and parts, and furniture and other household equipment. From the Economic Report of the President, durable goods consumption and total wage and salary income is employed to calculate the value for i.

$$DG_{UR} = (i)\ (PI)_{UR}$$

$$\$23{,}702{,}369 = (0.1585)\ (\$149{,}541{,}761)$$

The Multiplier Effect

The University of Akron contributes economic benefits through the attracting of funds from outside Summit County. The expenditure of these funds produce a chain of additional spending beyond the immediate impact. When money is spent for some purpose, it does not disappear. A portion of the money remains in the community to be spent and spent again. A portion of the money leaks out of the area through taxation or by consumer expenditure outside the community. The expansion in Summit County sales that results from the expenditure of funds typically possesses an effect where the total change in income for Summit County is greater than the dollar volume of the initial expansion alone. (Faas, 1980). The multiplier approach attempts to estimate this additional economic impact and its effect on Summit County. Multipliers are a way to estimate the sum of all spending and responding without having to add up each individual transaction.

There exists two major limitations on the use of these multipliers. First, the multipliers reflect mean, not marginal, propensities, or relationships, among county economic sectors with no guarantee, or suggestion, that the same relationship will hold for changes at the margin. For example, the size of a reduction in state funds may not result in a drop in other sources of income in an equivalent amount. Also, the magnitude of the impact will depend on how long the reduction is sustained. Second, the multiplier effect is often inappropriately employed in economic impact studies because it fails to consider what economists term opportunity cost, or the value of alternative uses of taxpayer money (Hunter 1989). Its omission distorts government investment in private business. Governments cannot spend themselves into prosperity.

The accuracy of a multiplier depends on how well it reflects the actual economic relationships on a particular local economy. Since these actual relationships are difficult and costly to determine, it is difficult to judge which size multiplier might be more reasonable. The magnitude of any multiplier varies among localities at any point in time, as well as, over a period of time for any one locality. Economic impact analyses do have some major differences. Some rely on an existing input-output table to calculate indirect economic effects. Others use the detailed equations developed for the American Council on Education or for the National Endowment for the Arts. Still others use multipliers previously reported in the literature. Some others develop their own local or regional value added ratios through which they construct their own multiplier.

As expected, the wide variety of computational methods and the wide variation of local and regional economies yield a range of values for the multipliers. They range from below 1.5 to over 3.0. For community economic impact studies, a clustering appears between the values 1.9 and 2.5. The range of multipliers for statewide studies is 2.0 to 4.0. Since a state has a more varied economic base, consequently, fewer dollars leak out of state. Therefore, a statewide multiplier is usually larger than a county multiplier. Multiplier effects can only be statistically estimated, not traced directly. A multiplier value of less than 2.0 appears to be an average from among those computed across differing urban areas. Caffrey & Isaacs (1971) suggest that the multiplier should range in value from 1.75 to 3.0. For this study, the lower multiplier value is used.

The Caffrey and Isaacs models use four different multipliers. These multipliers are employed to estimate the ripple effect that occurs as a consequence of an initial economic stimulus. The values for each of the four multipliers are shown in Table Eight.

TABLE EIGHT

MULTIPLIERS VALUES

Multiplier	Model	Caffrey & Isaacs Range	The University of Akron
m_p	B-1.2	0.15 to 0.30	0.15
m_i	B-1.3	0.60 to 0.80	0.60
j	I-1	0.00007 to 0.00009	0.00008
p	I-2	0.50 to 0.66	0.58

Source: Adapted from Caffrey and Isaacs.

The first multiplier, m_p, represents the proportion of receipts from county sources used in turn to purchase goods and services from county sources. The larger the region, the larger the proportion of expenditures that remains in the local economy. The range of values suggested by Caffrey and Isaacs is $0.15 to $0.30 per dollar of expenditures. Summit County contains a medium sized city, therefore a multiplier value from the middle of the range is used in this study.

The second multiplier, m_i, indicates the relative proportion of income received by individuals from local sources that is spent and spent again locally. The same rationale that we employed for the first multiplier is used here. The values offered by Caffrey and Isaacs ranges from $0.60 to $0.80 per dollar of expenditures.

The third multiplier, j, assists in estimating the additional number of full-time jobs that are generated per dollar of direct local expenditures.

The larger and more diversified the local area, the easier it is to deal with an increased demand for labor as a consequence of large expenditures. The larger the geographical area, the smaller the value of this multiplier. The same rationale as previously given is used to select the value here. Caffrey and Isaacs recommend a domain of values from seven to nine extra jobs per ten thousand dollars.

The fourth multiplier, p, indicates the total amount accruing to county residents from the initial mean dollar spent by county households in the area. The same rationale as previously given is used to select the value here. Caffrey and Isaacs recommend a domain of values from $0.50 to $0.66.

HUMAN CAPITAL DEVELOPMENT

As mentioned in the geographic section, there exist at least five separate economic mechanisms, or linkages, which transmit the effects of The University of Akron onto its service area. The linkage that is briefly discussed in this section is the productivity of university graduates and the earnings potential which occurs as a consequence of their advanced levels of formal education. In their synthesis of approximately 2,600 pieces of research about the potential effects of the university experience on students, Pascarella and Terenzini (1991) state that when controlling for different levels of academic ability, social origin, age, gender, and occupational category, successful completion of a formal baccalaureate education has a strong positive association with lifetime earnings, especially through its enhancement of educational status.

The University of Akron is a major source of human capital formation for the occupations and the professional fields. Attaining the bachelor's degree carries important implications for an individual's lifetime earnings. In modern society, changes in the occupational status and income, or inter-generational social mobility, is inextricably linked to successful completion of a post secondary education. As one moves up the degree ladder, lifetime earnings increase. Colleges and universities traditionally have been entrusted to educate and certify individuals. A baccalaureate degree is often referred to as a passport to the American middle class. It serves to bring minorities from the urban area and those from rural areas into the socio-political, economic mainstream.

Yet, there exists debate over the power of a baccalaureate degree to confer high occupational status. There are those who believe that a university, by means of a series of curricular and extracurricular experiences, imparts cognitive skills, values, personality characteristics, attitudes and behavior patterns that are valued by employers in "high-status" occupations (i.e. complex technical, professional and managerial). Economists use the terminology of human capital and sociologists speak of socialization to describe this approach. The competing noncognitive school views a university as providing a screening, credentialization or certifying function. The university degree is used as a means to allocate occupational status to those who possess the requisite intellectual and personal traits to complete the prescribed course of study. Society grants a charter to the university to select, sort and confer adult status apart from what was learned during college (Pascarella and Terenzini 1991).

The decision to acquire additional education is a social investment which results in increased productivity for the economy at large. While sacrificing present earnings, to some degree, the student is investing in education with the expectation that lifetime levels of income will more than make up for the cost incurred while attending school. Not every individual who attends college does to solely to make more money. The intangible benefits of personal enrichment, greater appreciation of the arts and literature are also elements which persuade people to commit to education. Regardless of individual motives, the end result is a more socially productive person and a more efficient economy.

Education and human resource development are particularly important determinants of the growth of productivity and total output. U. S. economic growth between 1929 and 1969 was a consequence of many factors. Yet, advances in knowledge and increased educational attainment of the work force accounted for 31.1% and 1.41% of total growth, respectively (Denison 1974).

The conclusion is inescapable that higher education pays off. Individuals who complete post secondary education have lower rates of unemployment. A major effect of a university education on one's career is apparent on the level of work force participation and upon the stability of one's employment. The difference in the unemployment rate between a university graduate and a high school graduate has not decreased substantially for the past three decades (Pascarella and Terenzini 1991). For example, in 1985, 15.9% of those with less than a high school diploma were unemployed, while only 2.6% of them with four or more years of college were unemployed. Further, lifetime earnings of individuals who have graduated from institutions of higher education tend to be higher than those of less educated individuals.

TABLE NINE

EARNINGS BY EDUCATIONAL ATTAINMENT

Percentage * Population	Education Level	Mean Monthly Earnings
23%	no high school diploma	$452
37%	high school, no college	$921
20%	some college, no degree	$1,088
04%	associate degree	$1,458
12%	bachelor degree	$1,829
47%	master degree	$2,378
1%	doctorate	$3,637
1%	professional degree	$4,008

Source: U. S. Department of Commerce, Bureau of the Census. 1991. Does Education Pay Off? (* Rounding of figures).

In estimating the private rates of return to the recipient of a university education, Leslie & Brinkman (1988) report that a baccalaureate undergraduate degree yields a 11.8 to 13.4 percent return, one year of graduate work yields 8 percent additional income, the master's degree returns about 7.2 percent and the doctorate returns about 6.6 percent. Private rates of return reflect variation in costs, not earnings. Rates of return to education are sensitive to educational costs to the individual rather than to the differential in earnings between different levels of education. For example, the private rate of return to elementary schooling is higher than for any other level of education. The private rates decline as the educational level is increased to the baccalaureate and graduate degree levels. However, this high rate of return for elementary school derives from the fact that private costs of elementary school are near zero due to child labor laws and free public education. By contrast, university education typically requires a student to forego substantial earnings while attending college and to pay the highest share of the direct costs of any educational level. As a consequence, their respective rates of return are relatively lower. Rate of return to education varies not because earnings vary but because costs vary. The private rate of return cost sensitivity principle suggests that should rates of return be judged too low at any given educational level, it is prudent to raise public subsidies at that particular educational level.

Employment has become the way many adults identify themselves, organize their lives, and contribute to the human community. In an international information world society, the maintenance and growth of relatively high incomes requires the development and use of advanced technology. Educated, motivated, trained, healthy people are an almost unlimited asset and are more important than physical capital or natural resources. Higher standards of quality, productivity, and flexibility are required to maintain power and relatively high incomes in a more competitive environment.

Failure to maintain technological advances (i.e. the use of knowledge, tools and skills to solve practical problems and extend human abilities) implies competing according to wages which in turn implies a declining standard of living. Information technology changed the nature of work itself because it facilitated highly automated processes and made possible more custom precision work requiring ever more sophisticated skills, teamwork, integration and worker cooperation.

SUMMARY AND CONCLUDING REMARKS

In many communities, a university is a significant factor. A university can have a substantial effect on its community. The relationship between the local economy and the university is one with plural impacts. For example, a university does the obvious things, such as, teaching, public service and research. It also provides business and government with a well trained labor force, creates new knowledge and the technical expertise to apply it, broadens the community's cultural resources, brings a flow of people with different perspectives and life styles, and educates the younger generations in the values our society. It also is a source for low-cost student labor, political discourse, pride and entertainment. Since there exist many impacts, it is quite difficult to place a dollar value on these intangibles. The models used in this study do not account for the lifetime income and productivity of its graduates nor their quality of life.

Higher education can contribute to one's toleration for diversity, ability to handle ambiguity and to cope with stress. In fact, education enables one to be a more productive employee and a leader. University graduates are more employable, capable of greater productivity, more inclined to improve ability through continuing education, likely to have higher earnings over their working lifetime, and constitute a reservoir of skilled employee knowledge that can be used to stimulate the development of new local enterprises and to encourage out of town employers to move to Summit County. They also return a share of this advanced earnings capacity to local, state, and federal governments in taxes. In the long term, investments in higher education return more than they initially cost. Education is a major contributor to the economic growth of the U. S.

Since economic impact studies focus on the external financial resources captured by individuals other than college graduates, such as community members who profit from spillovers from academic institutions, they make a case for community support of local university INDEPENDENT of other arguments. To learn more about the economic costs and benefits of a university, many institutions have studied their impact on their community. Collectively, these studies represent a significant body of literature.

This study does not reflect a comprehensive in-depth picture of all economic relationships between the University of Akron and its region. Practical considerations make such a goal unrealistic. The results provide a means by which to assess an important segment of the varied and complex set of economic interrelationships. There exists no solitary measure through which one can specify The University of Akron's impact. As this study indicates, there are several quantitative ways by which one may assess the university's role within its regional educational, cultural, and economic quality of life.

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* Studies unavailable through Bierce Library.

Appendix A: Comparison of The University of Akron Studies

Model Number	Hanteen & Stratten 1979-1980	Simmons 1991-1992
B-1	$252,117,479	$222,080,430
$M = (1 + m_p + m_i)$	2.7	1.75
B-1.1	$63,213,023	$126,903,103
B-1.1.1	$17,524,083	$15,802,856
B-1.1.2		$17,951,675
B-1.1.2.1		$4,484,405
B-1.1.2.2		$12,290,649
B-1.1.2.3		$1,176,621
B-1.1.3		$69,394,336
B-1.1.3.1		$13,955,250
B-1.1.3.2		$12,664,638
B-1.1.3.3		$7,461,090
B-1.1.3.4		$31,855,706
B-1.1.3.5		$3,457,652
B-1.1.4		$3,513,362
B-1.1.5		$20,240,874
B-1.2	$116,871,182	$19,035,465
m_p	0.30	0.15
B-1.3	$72,033,682	$76,141,862
m_i	1.4	0.60
B-2		$152,834,935
B-2.1		$75,173,974
B-2.2		$20,720,104
B-2.3		$56,939,835
B-3	$46,651,195	$28,629,079
B-4	$9,890,936	$22,556,502
G-1	$ 5,412,530	$17,039,501
G-1.1		$4,545,976
G-1.1.1		$0
G-1.1.2		$2,246,780
G-1.1.3		$2,299,196
G-1.2		$3,981,785
G-1.2.1		$118,410
G-1.2.2		$3,863,375
G-1.3		$2,024,683
G-1.4		$307,337
G-1.5		$5,981,956
G-1.5.1		$1,040,055
G-1.5.2		$1,606,223
G-1.5.3		$3,043,587
G-1.5.4		$292,091
G-1.6		$197,764

G-2		$51,448,456
G-2.1		$36,130,304
G-2.2		$2,176,534
G-2.3		$13,141,618
G-3	$3,257,416	$35,509,249
G-3.1	$ 1,871,467	$32,740,943
G-3.2	$ 1,883,238	$3,768,306
G-4		$41,282,957
G-5	$ 3,600,974	$4,171,149
G-6	$532,892	$1,602,315
I-1	4,678	15,178
j	0.000046	0.00008
I-2		$149,541,761
p		0.58
I-3		$23,702,369
i		0.1585

Appendix B: Summary of Higher Education Economic Impact Studies

Many studies on the economic impact of higher education have been performed. This appendix serves to provide a listing of the institutions of higher education that have undertaken an economic impact study and to provide the value used for the multiplier in each study.

TABLE B - ONE

Studies Cited in the Bibliography

(Reverse Chronological Order)

Institution or State	Year	Multiplier
Bakersfield College (CA)	1964	None
Winona State College	1964	None
University of Bridgeport	1964	None
Portland State College	1965	None
Northern Michigan University	1967	2.0
Husson College	1967	2.33
Washington State University	1967	*
Tulane University	1967	None
Jacksonville University	1968	2.5
State of Missouri independent colleges	1968	2.9
Mt. Hood Community College (OR)	1968	*
University of Connecticut	1969	None
Spokane Community College	1969	None
University of Florida	1970	1.4
University of Wisconsin Eau Claire	1970	yes
Indiana State University	1970	1.56
State University College at Oswego	1970	None
University of South Florida	1970	1.40
Wisconsin State University	1970	2.0 - 2.3
Eastern Kentucky University	1971	1.75
Idaho State University	1971	None
Appalachian State University	1971	1.9
University of Alabama	1971	4.35
Claremont Colleges (Caffrey-Isaacs)	1971	1.2 - 3.0
Ball State University	1971	1.9
Virginia Polytechnic & State University	1971	*
Hampden County Colleges (MA)	1971	1.95
University of Pittsburgh	1972	2.0
Kent State University	1973	1.09
Harrisburg Area Community College (PA)	1973	1.45
University of Denver	1973	1.9
University of Calgary	1973	None
Rochester Institute of Technology	1973	*
University of Wisconsin Green Bay	1973	1.3199
University of Wisconsin Milwaukee	1973	2.2
University of Wisconsin Parkside	1973	1.3944
University of Wisconsin Platteville	1973	1.2661

University of Wisconsin River Falls	1973	1.5788
University of Wisconsin Stevens Point	1973	1.3457
University of Wisconsin Superior	1973	1.3557
Northwest Missouri State University	1977('73)3	0.97(1.67)
Burlington County College (NJ)	1974	*
Northwest Alabama State Junior College	1974	None
Cypress College (CA)	1974	2.4
Florida Junior College Jacksonville	1974	1.9
University of Colorado	1974('68)	*(1.375)
Alcorn State University	1974	1.7
State of North Dakota Higher Education	1975	2.10
Kansas City Metro community colleges	1975	2.7
State of Indiana independent colleges	1975	*
Eastern Illinois University	1975	1.75
Chemeka Community College	1975	1.9
Shippensburg State College	1975	1.75
Virginia Community College System	1976	1.78
University of Wisconsin La Cross	1976	1.1824
Potomac State College (W VA)	1976	*
Elizabeth City State University	1976	*
University of California Santa Cruz	1976	*
University of Rhode Island	1976('72)	5.0
Indiana State University	1976('71)	1.4064(1.51)
University of Illinois System	1977('66)	5.20 (2.015)
University of Southern Mississippi	1977	None
State of Washington System	1977	1.3
Kalamazoo Valley Community College	1977	None
I.U.-P.U.: Fort Wayne	1977	2.0
Genesee Community College (NY)	1977	1.83
Onondga Community College (NY)	1977	2.38
University of Minnesota Duluth	1978	1.19
SUNY Binghampton	1978	1.75
Georgia Institute of Technology	1978	2.94
New York independent colleges	1978	2.0
Mohawk Valley Community College (NY)	1978	1.8
Maryland Community Colleges	1978	2.0
Allegheny Community College (MD)	1978	1.3
Mercer County Community College (NJ)	1978	1.42
Andrews University (MI)	1978	2.58
Western Kentucky University	1978	1.318
Rockland Community College (NY)	1978	1.9
State of Washington Community Colleges	1978	None
Radford College (VA)	1978	*
Trenton State College (NJ)	1979	1.6
Bucks County Community College	1979	1.4
Murray State University	1979	*
Brown University	1979('71,'60)	2.0
Syracuse University	1979	2.38
SUNY System	1979	1.30 - 1.96
Georgia State University	1979	1.22 - 1.78
Thomas Nelson Community College (VA)	1980	1.3
Gainesville Junior College (FL)	1980	2.5
Louisiana State University System	1980	1.68
University of Arkansas Football	1980	1.5

St. Cloud State University (MN)	1980('76)	2.0-2.2(1.34)
Illinois community colleges	1980	2.5-3.6
Massachusetts independent colleges	1981	1.64
Commonwealth of Pennsylvania schools	1981	1.69
Johns Hopkins University (MD)	1981('67)	2.01
Community College of Alleghany County	1981	1.35
University of Akron	1981	2.7
State of Michigan community colleges	1981	None
University of Cincinnati	1982('74)	*(0.80)
Long Beach City College	1982	2.27
State of Oregon community colleges	1982	1.00
Umpqua Community College	1982	2.82
Ramapo State College (NJ)	1982	2.00
Montgomery College	1982	1.4
State of Vermont Higher Education	1982('79,'64)	1.2-2.0(2.59)
State of Arizona universities	1982	1.37
University of Nebraska Omaha	1982	2.0
Madison Technical College (WS)	1982('71)	*
SUNY Buffalo	1982	1.60
Caldwell Community College	1982	1.52
Community College of Philadelphia	1982	*
Cuyahoga Community College	1982	*
Harper College (IL)	1982	2.25
Schenectady County Community College	1983	1.6
Brookdale Community College (NJ)	1983	2.0
State of New Jersey Community Colleges	1983	2.5
Bismarck Junior College	1983	1.8
Malaspina College	1983	1.3
St. Louis Community College	1984	2.5
Northern Kentucky State University	1984	1.8
Indiana University Southeast	1984	1.6
California:	1984	
California State University		2.43
University of California ('83,'76,'67)		2.78
community colleges		2.50
independent colleges		2.78
State of Arkansas	1984	2.37-4.16
Caldwell Community College	1984	1.52
University of Iowa	1984	3.56
State of Maryland	1985	2.2
Arizona State University	1985('79)('73)	1.51(1.9)
University of Louisville	1985	*
Kentucky State University	1985	*
State of Kansas Community Colleges	1985	1.5
Broome Community College (NY)	1985	1.9
South Carolina State University	1986	3.82
Michigan Technological University	1986('74)	1.95
University of Central Florida	1986	*
Pueblo Community College	1986	4.65
Berry College	1986	*
St. Cloud State College	1987	2.1177
Elizabethtown Community College	1987	*
Gainesville Junior College (GA)	1987	1.652

Georgian Court College	1987	2.00
Commonwealth of Kentucky	1987	2.4
State of South Dakota	1987	1.92
University of Tennessee	1987('81,'73)	1.75(1.343)
State of Virginia Higher Education	1987	1.2
SUNY Community Colleges	1988('82)	1.0-2.6(2.06)
University of Wisconsin Madison	1988('72)	2.24 (2.19)
Central Community College (NE)	1988	2.0
Los Rios Community College District	1988	1.42613
West Virginia State University	1990	1.1
Liberty Baptist University (VA)	1990('82)	1.31(1.18)
University of Virginia	1990('81)('73)	None(1.57) (1.397)
Georgia State University	1990 ('83,'79,'76,'73)	1.48 (4.04)
Bristol Polytechnic	1990('81)	1.2 (1.15)
El Passo Community College	1990	2.4
Southwest Missouri State University	1990('85)	2.26(2.26, 2.41)
Broward Community College (FL)	1990	*
Brigham Young University	1990('86)	1.5
University System of New Hampshire	1990('82,'73)	1.7(1.55)
UNC Chapel Hill	1990	2.01
D. C. Metropolitan area consortium	1991	1.5
Johnson County Community College (MO)	1991	2.25
Miami-Dade Community College	1991('86)	2.25-.7(1.26)
University of Alaska - Fairbanks	1991	1.5
State of Washington	1991	*
Florida Community College System	1991	*
Cleveland State University	1992('81)	1.4(2.0)
Ohio State University	1992	2.5

* Studies not available through Bierce Library.

TABLE B - TWO

Economic Impact Studies by Colleges and Universities Referred in the Literature But Not Listed in the Bibliography (Reverse Chronological Order)

Institution or State	Year	Multiplier
State University of New Jersey Rutgers	1959	
Texas Technological College	1966	
Georgia University System	1966	
State of Utah Colleges	1966	
Wesleyan University (CT)	1968	
Gonzaga University	1968	
University of Kansas	1971	
University of Wisconsin	1971	

Boston University	1971	
University of Washington	1972	1.4
Fort Hayes State College	1972	1.62
Kansas State College	1972	
Eastern Montana College	1972	
University of Oregon	1973	
Bemidji State College	1973	
SUNY Geneso	1973	1.75
University of Utah	1973	
University of California Irvine	1973	
University of California Riverside	1974	
University of California San Diego	1974	
University of California Santa Barbara	1974	
University of Arizona	1974	
California State University	1979	
Edinboro State College	1980	
Slippery Rock State University	1981	
University of Delaware	1981	1.48
Northern Arizona University	1982('79)	
Medical University of South Carolina	1984	1.96
University of South Carolina Beaufort	1984	
University of Georgia	1984	1.58
University of Arizona	1984	
Wright State University	1985	
New York	1986	1.703
Idaho State University	1988	
SUNY Stony Brook	1990('86)	
Emory University	1991	1.11
Illinois State University		
University of South Florida		
University of New Hampshire		
University of Michigan		
Washington & Jefferson College (PA)		
Carnegie-Mellon University		
Gannon University (PA)		
Juanita College (PA)		
Temple University		
Lycoming College (PA)		
University of Scranton (PA)		
Alabama State Junior College		
Bakersfield College (CA)		
Metropolitan Community College (MO)		
Valencia Community College (FL)		
Boise College		
Boston area colleges		
Drake University		
University of Indiana		
University of Maine		
Villanova University		
Widener University (PA)		

Appendix C: DATA SOURCES

Most of the data necessary for the completion of this study came from community or university records and was sometimes supplemented with estimates derived from explicit assumptions about likely behaviors. Since university funding and budgets are constrained, there existed no opportunity to employ detailed surveys of the thousands of university employees and students in the collection of statistical data. The value of this approach lies not only in its equity and honesty, but in the credibility of its results. So that others may more readily duplicate the results of this study, the sources from where the data were obtained are identified in this appendix.

SYMBOL	INFORMATION	SOURCE
E_U	Total expenditures by The University of Akron	university controller
$(e_{SC})_U$	Estimate of the proportion of the purchases made by university from Summit County businesses by zip code	university controller
w_{FASST}	Wages and salaries of faculty, administrators, staff and students	university controller
XF_U	Interdepartmental charges within and between colleges	university controller
SC_U	Taxes and other payments to governments	university controller
DI_i	Mean annual disposable income: faculty, administrators/librarians, and staff	university personnel
f_{SCi}	Proportion of employees who reside inside Summit County	university personnel
f_{Hi}	Proportion who rent housing	U.S. Census Bureau
e_{Hi}	Proportion of an employee's total expenditures likely to be spent on rent	U.S. Bureau of Labor Statistics
e_{SC}	Proportion of total non-housing expenditure that an employee is likely to make in Summit County as a result of the gravity theory approach to retail sales	Caffrey & Isaacs
$(e_{NH})_i$	Proportion of a consumer's total expenditure that is spent on non-housing items	U.S. bureau of Labor Statistics

$(E_1)_i$	**Mean local expenditures by each employee who resides outside of Summit County**	**Rule of Thumb**
F	**Number of faculty**	**University personnel**
A	**Number of administrators and librarians**	**university personnel**
S	**Number of staff**	**university personnel**
$(S_{UH})_{STi}$	**Students who live in university housing, such as dormitories, Greek facilities, apartments**	**university housing**
$(S_{WP})_{STi}$	**Students who live at home with parents or relatives**	**university housing**
$(e_{SC})_{STi}$	**Proportion of total expenditures, exclusive of room and board, that a student is likely to spend in Summit County**	**Rule of Thumb**
$(E_m)_{STi}$	**Mean per capita miscellaneous non-university expenditure made by the student**	**University Financial Aid**
$(S_H)_i$	**Number students that rent housing in Summit County**	**Rule of Thumb**
$(E_h)_i$	**Mean per capita housing expenditures**	**university financial aid**
$(E_{NH})_{STi}$	**Mean per capita non-housing expenditures**	**university financial aid**
(S_{NSCSTi})	**Number of out-of-county students**	**university registrar**
$(E_l)_{STi}$	**Estimated mean expenditures by the student**	**university financial aid**
$(E_{SC})_{GH}$	**Rental housing expenditures by student living groups**	**university housing**
$(e_{SC})_{GH}$	**Proportion of nonhousing expenditures made by living groups**	**Rule of Thumb**

$(E_{SC})_{GO}$	**Operating and food expenditures made by living groups**	**U.S. Bureau of Labor Statistics**
$(E_{SC})_{V}$	**Visitors to the university:**	**Guesstimate**
m_p	**Degree to which county businesses purchase goods and services from other county businesses**	**Caffrey & Isaacs**
m_i	**Proportion of income received from university-related business activity that is spent and spent over again on a county-wide basis**	**Caffrey & Isaacs**
V_B	**Assessed valuation of the property**	**county auditor**
ibv	**Inventory-to-business ratio**	**I.R.S.**
OP	**Value of regional business property other than real estate and inventory**	**county auditor**
TA_U	**Mean dollar amount that the university owns or has access through in its foundation**	**university foundation**
d	**Legal minimum demand deposit on account**	**Federal Reserve**
cbv	**Cash-to-business-volume ratio**	**I.R.S.**
$(BV_U)_{UR}$	**U.A. Auxiliary Enterprises:**	**university controller**
$(SC_{RE})_U$	**Inter-governmental tax immunity renders almost all University of Akron real property and its improvements non-taxable.**	**university controller**
FAS_{SC}	**Number of faculty, administrative and staff who live in Summit County**	**university personnel**
(f_O)	**Proportion of faculty, administration and staff who own homes in Summit County**	**university personnel**
V_{PR}	**Total valuation of Summit County private residences**	**county auditor**
pt	**Effective residence property tax rate after HB 920 reduction factors**	**Department of Taxation**

N_{PR}	Total number of Summit County private residences	county auditor
$(SC_{RE})_{ST}$	Dollar value of property taxes paid by students who reside in local living groups	Rule of Thumb
R_{SC}	Total motor vehicle revenue received by Summit County governments	Department of Taxation
POP_{SC}	1990 total population of Summit County	U.S. census Bureau
POP_O	1990 total population of the State of Ohio	U.S. Census Bureau
ppt	Mean property tax rate for tangible personal property	Department of Taxation
V_{PP}	Total assessed valuation of county tangible and personal property	county auditor
SC_{TST}	Total sales tax collected in Summit County	county executive
OSC_P	County per capita state aid, other than education, from alcoholic beverage taxes, cigarette tax, insurance tax, and horse racing tax	Department of Taxation
OST_{SC}	County revenue received from the state under statutory requirements	Department of Taxation
FH_{SCj}	Number of related persons living in faculty households	university personnel
SFH_{SCj}	Number of related persons living in student households	university personnel
A_{PS}	Total state aid to county public schools	county auditor
$(CH_{PS})_{FAS}$	Number of children from university employee households	university personnel
$(CH_{PS})_{ST}$	Number of children from university student households	university personnel
CH_{PS}	Number of students in county public schools	U.S. Census Bureau
$(SC_Q)_{UR}$	Catch all revenue category	university controller

SR_{PT}	**Population taxes, such as: gasoline tax, tobacco product tax, alcoholic beverage tax, insurance tax, and investment revenue**	**Department of Taxation**
SR_{IT}	**Total Ohio personal income tax revenue for the fiscal year**	**Department of Taxation**
PI_S	**Total Ohio personal income for calendar year 1991**	**Department of Taxation**
SR_{BT}	**Total business taxes paid to the State**	**Department of Taxation**
B_{MS}	**Municipal county services operating budget**	**county auditor**
B_{PSS}	**Operating costs of county public schools exclusive of other county government operating costs**	**county auditor**
T_l	**Proportion of public school taxes raised locally, LE; by state, O; and by the federal government, US.**	**Expenditure Council**
GP_M	**Total value of all Summit County governmental property, exclusive of school property**	**county auditor**
GP_{PS}	**Total value of all educational property in Summit County**	**county auditor**
$(RF_{RE})_U$	**Estimated foregone property taxes due to university's exempt status**	**university records**
$(OC_M)_{SU}$	**Value of Municipal-Type Services Self-Provided by the University**	**university controller**
j	**Number of local jobs per direct expenditures**	**Caffrey and Isaacs**
p	**Payroll and profits per dollar of direct expenditure in Summit County**	**Caffrey and Isaacs**
i	**Proportion of total income used to purchase durable good**	**Economic Report**

Appendix D: HISTORY OF THE UNIVERSITY OF AKRON

The self conscious connection between The University of Akron and its surrounding community has been a recurring theme from the institution's founding as a small denominational college in 1870 to its current standing as a major metropolitan state university. It is significant that the efforts, energy, and financial support of an Akron manufacturer of farm equipment, John R. Buchtel, were instrumental in persuading the Ohio Universalist Convention to build its college on a hill overlooking the town stretched along the Ohio Canal. The grateful trustees responded by naming the school Buchtel College. It is also significant that during its first four decades, the struggling institution was repeatedly aided in its efforts to survive by various local entrepreneurs who pioneered and prospered in such industries as cereals, clay products, matches, and rubber. Buchtel College's emphasis on local rather than denominational interests became increasingly clear, and by 1913 those strong ties and the school's financial situation caused its trustees to transfer the institution was repeatedly aided in its efforts to survive by various local entrepreneurs who pioneered and prospered in such industries as cereals, clay products, matches, and rubber. Buchtel College's emphasis on local rather than denominational interests became increasingly clear, and by 1913 those strong ties and the school's financial situation caused its trustees to transfer the institution and its assets to the city. For the next 50 years, the Municipal University of Akron received its principal support from city tax funds and swelled from an enrollment of 198 to nearly 10,000.

The growth of the college paralleled the remarkable expansion of the community itself. From 1910 to 1920 Akron was the fastest- growing city in the country, evolving from a thriving canal town of 70,000 to a major manufacturing center of 208,000 thanks in large part to a boom in local factories that bore names such as Goodyear, Firestone, Goodrich, and others. The age of the automobile - and the demand for inflatable rubber tires - changed the complexion of Akron forever.

And changes within the Municipal University's curriculum reflected the strong interrelationship of town and gown. In 1914 a College of Engineering began instruction, and other professional schools followed: education (1921), business administration (1953), law (1959), The Community and Technical College (1964), a fine and applied arts (1967), and nursing (1967).

Considering the institution's location in the heart of the burgeoning rubber industry, it seemed only appropriate that the world's first courses in rubber chemistry would be offered at Buchtel College in 1909. From those first classes in Professor Charles W. Knight's laboratory would evolve the prestigious College of Polymer Engineering (1988), a world leader in polymer research. In the 1930s and 1940s, with the establishment in Akron of the Guggenheim Airship Institute, The University of Akron scientists studied the structure and design of zeppelins, and during World War II University of Akron researchers helped fill a critical need in the U.S. war effort by contributing to the development of synthetic rubber.

But research, innovation, and creative activity take many forms at the University, in the sciences and in the arts and humanities as well. Today The University of Akron faculty members study ways of matching workers with jobs to maximize performance; they devise more effective methods of extracting oil from shale; they write and produce plays, pen poetry, choreograph dance works; they design valves for artificial hearts and explore improved methods of tumor detection; they evaluate the quality of water in Northeast Ohio; they draft new maps to meet specialized needs of local businesses and industries,; and they study laws of taxation and their effects on commerce. The University of Akron's continuing and central commitment to the liberal arts is signified by the perpetuation of the institution's original name in the Buchtel College of Arts and Sciences.

And the University has maintained an openness to innovation in other ways. As early as the 1880s Buchtel College was liberalizing its curriculum by allowing students to choose free electives within their courses of study. The University later adopted and developed the general education concept, which represents an attempt to prepare students for both their personal and their professional lives by providing a balance between courses that teach them how to make a living and courses that teach them about life as we know it in Western civilization.

The University's first doctoral degree was, appropriately enough, awarded in Polymer chemistry in 1959, but master's degrees were granted as early as 1882. Doctoral work has now expanded to programs leading to the highest academic degree in 18 different fields of study.

In 1963, the receipt of state tax monies made The University of Akron a state-assisted municipal university and on July 1, 1967, The University of Akron officially became a state university. Today nearly 29,000 students from 43 states and 83 foreign countries are enrolled in its 10 colleges, making it the third largest university in Ohio, and 46th largest in the nation. Its 80,000 alumni are worldwide. The 162-acre main campus with its 77 modern buildings is within walking distance of downtown Akron and its shopping, restaurants, entertainment, and cultural centers. The Northeast Ohio metropolitan area, with its 1.5 million population, provides numerous opportunities in recreation, major collegiate, amateur and professional sports, concerts, cultural events, and commerce, all within easy driving distance and many accessible via public transportation.

For more than a century, the college on the hill has been an integral part of the city whose name it bears, an active participant in Akron's renaissance of commercial and artistic endeavor, a leader in the city's intellectual and professional advancement, a center of internationally lauded research efforts, a source of enrichment, education, and vitality both for itself and for its community. Our history is a long and proud one - but at The University of Akron, our eyes are on the future, for our students, our faculty and staff, our community, our world.

Source: The University of Akron General Bulletin. 1991. (Akron, OH: The University of Akron). p.4.

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